SIEMENS

ACUSON SC2000™ Volume Imaging Ultrasound System

DICOM Conformance Statement

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CONFORMANCE STATEMENT OVERVIEW

The **ACUSON SC2000™ Volume Imaging Ultrasound System** supports the following DICOM Application Entities:

- Verification
  - o Verification AE
- Transfer
  - o Storage AE
  - o Storage Commitment AE
- Query / Retrieve
  - o Query AE
  - o Retrieve AE
- Workflow Management
  - o Worklist AE
  - o MPPS AE

Table 1. NETWORK SERVICES

SOP Classes	Service Class User (SCU)	Service Class Provider (SCP)
VERIFICATION		
Verification AE		
Verification	Yes	Yes
TRANSFER		
Storage AE		
Ultrasound Image Storage	Yes	Yes
Ultrasound Multi-frame Image Storage	Yes	Yes
Secondary Capture Image Storage	Yes	Yes
Comprehensive SR	Yes	Yes
Raw Data Storage	Yes	Yes
Storage Commitment AE		
Storage Commitment Push Model	Yes	No
QUERY / RETRIEVE		
Query AE		
Study Root Query/Retrieve Information Model – FIND	Yes	No
Retrieve AE		
Study Root Query/Retrieve Information Model – MOVE	Yes	No
WORKFLOW MANAGEMENT		
Worklist AE		
Modality Worklist	Yes	No
MPPS AE		
MPPS (N-Create, N-Set)	Yes	No

Table 2. UID VALUES

SOP Class Name	SOP Class UID	Category
Verification AE		
Verification	1.2.840.10008.1.1	Verification
Storage AE		
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Transfer
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Transfer
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Transfer
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Transfer
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Transfer
Storage Commitment AE		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Transfer
Query AE		
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Query / Retrieve
Retrieve AE		
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Query / Retrieve
Worklist AE		
Modality Worklist	1.2.840.10008.5.1.4.31	Workflow Management
MPPS AE		
MPPS (N-Create, N-Set)	1.2.840.10008. 3.1.2.3.3	Workflow Management

Table 3. MEDIA SERVICES

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
DVD—Recordable		
STD-US-ID-SF-DVD	Yes	Yes
STD-US-ID-MF-DVD	Yes	
Compact Disk—Recordable		
STD-US-ID-SF-CDR	Yes	Yes
STD-US-ID-MF-CDR	Yes	

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1 INTRODUCTION

This document describes the conformance to the ACR-NEMA DICOM 3.0 Standard by the ACUSON SC2000™ volume imaging ultrasound system, versions VA16D and VA16E from Siemens Healthcare. It shall establish the conformance specifications for this system only, and does not apply to other products offered by Siemens Healthcare or its affiliates.

The ACUSON SC2000 system is a device that generates ultrasound images that can be sent using DICOM standard protocols and definitions to other DICOM compliant devices that support SOP classes as defined in Table 2-1: SOP Classes for Storage AE in this document.

The DICOM standard provides a well-defined set of structures and protocols that allow inter-operability of a wide variety of medical imaging devices. The ACUSON SC2000 system provides support for essential services related to ultrasound scanning and connectivity to DICOM compliant devices. ACUSON SC2000 systems will not support all features supported by the DICOM standard. This document clearly states the DICOM services and data classes that are supported by the applications included with the ACUSON SC2000 system. The intent of this document is to allow users and other vendors who also conform to the DICOM standard to exchange information within the specific context of those elements of the DICOM standard that the ACUSON SC2000 system supports.

This document is written with respect to the adopted portions of the DICOM standard, Version 3. The following sections of this document follow the outline specified in the DICOM Standard NEMA publication PS3.2.[1]

1.1 Audience

This document is written for the people that need to understand how the ACUSON SC2000 system will integrate into their healthcare facility. This includes both those responsible for overall imaging network policy and architecture, as well as integrators who need to have a detailed understanding of the DICOM features of the product. This document contains some basic DICOM definitions so that any reader may understand how this product implements DICOM features. However, integrators are expected to fully understand all the DICOM terminology, how the tables in this document relate to the product's functionality, and how that functionality integrates with other devices that support compatible DICOM features.

1.2 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between the ACUSON SC2000 system and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard.

DICOM, by itself, does not guarantee interoperability. However, the Conformance Statement facilitates a first-level validation for interoperability between different applications supporting the same DICOM functionality as SCU and SCP, respectively.

This Conformance Statement is not intended to replace validation with other DICOM equipment to ensure proper exchange of information intended.

The scope of this Conformance Statement is to facilitate communication with Siemens and other vendors' Medical equipment. The Conformance Statement should be read and understood in conjunction with the DICOM 3.0 Standard [1]. However, by itself it is not guaranteed to ensure the desired interoperability and a successful interconnectivity.

[1] Source: DICOM® Standards Publication Part 2, © NEMA. The DICOM Standard is under continuous maintenance. The current official version is available at http://dicom.nema.org.

The user should be aware of the following important issues:

- The comparison of different conformance statements is the first step towards assessing interconnectivity.
- Test procedures should be defined and tests should be performed by the user to validate the connectivity desired. DICOM itself and the conformance parts do not specify this.
- The standard will evolve to meet the users' future requirements. Siemens is actively involved in developing the standard further and therefore reserves the right to make changes to its products or to discontinue its delivery.

Siemens reserves the right to modify the design and specifications contained herein without prior notice. Please contact your local Siemens representative for the most recent product information.

1.3 Terms and Definitions

Informal definitions are provided for the following terms used in this Conformance Statement. The DICOM Standard is the authoritative source for formal definition of these terms.

Abstract Syntax – The information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class. Examples: Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.

ACUSON SC2000™ system – The volume imaging ultrasound system of this conformance statement; also referred to as the SC2000.

Application Entity (AE) – An end point of a DICOM information exchange, including the DICOM network or media interface software; i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.

Application Entity Title – The externally known name of an *Application Entity*, used to identify a DICOM application to other DICOM applications on the network.

Application Context – The specification of the type of communication used between *Application Entities*. Example: DICOM network protocol.

Association – A network communication channel set up between *Application Entities*.

Attribute – A unit of information in an object definition; a data element identified by a *tag*. The information may be a complex data structure (Sequence), itself composed of lower level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).

Attribute Macro - A set of Attributes that are described in a single table that is referenced by multiple Module or other tables.

Information Object Definition (IOD) – A data abstraction of a class of similar Real-World Objects which defines the nature and attributes relevant to the class of Real-World objects represented. Examples: MR Image IOD, CT Image IOD, Print Job IOD.

Integrating the Healthcare Enterprise (IHE) – An initiative sponsored by the Radiological Society of North America (RSNA) to document and demonstrate standards-based methods of sharing information in support of optimal patient care. For additional information, see www.rsna.org/ihe.

Functional Group - A set of logically related Attributes that are likely to vary together. May be used in Multi-frame IODs to describe parameters which change on a per frame basis.

Joint Photographic Experts Group (JPEG) – Joint Photographic Experts Group, The group was organized in 1986, issuing a standard in 1992, which was approved in 1994 as ISO 10918-1. The JPEG standard is used by DICOM applications.

Media Application Profile – The specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs), see DICOM PS3.11.

Module – A set of *Attributes* within an *Information Object Definition* that are logically related to each other. Example: Patient Module includes (among others) Patient Name, Patient ID, Patient Birth Date, and Patient Sex.

Negotiation – First phase of *Association* establishment that allows *Application Entities* to agree on the types of data to be exchanged and how that data will be encoded.

Picture Archiving and Communications Systems (PACS) – A DICOM server that accepts medical images from another DICOM system and stores the images for later retrieval.

Presentation Context – The set of DICOM network services used over an *Association*, as negotiated between *Application Entities*; includes *Abstract Syntaxes* and *Transfer Syntaxes*.

Protocol Data Unit (PDU) – A packet (piece) of a DICOM message sent across the network. It contains protocol control information and user data. Devices must specify the maximum size packet they can receive for DICOM messages.

Request (RQ) – A request from one DICOM AE for service from another DICOM AE.

Response (RSP) – A response from one DICOM AE to the request for service from another DICOM AE.

Security Profile – A set of mechanisms, such as encryption, user authentication, or digital signatures, used by an *Application Entity* to ensure confidentiality, integrity, and/or availability of exchanged DICOM data.

Service Class Provider (SCP) – The role of an *Application Entity* that provides a DICOM network service; typically, a server that performs operations requested by another *Application Entity* (*Service Class User*). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).

Service Class User (SCU) – The role of an *Application Entity* that uses a DICOM network service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU).

Service/Object Pair (SOP) Class – The specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.

Service/Object Pair (SOP) Instance – An information object; a specific occurrence of information exchanged in a *SOP Class*. Examples: a specific x-ray image.

Structured Report (SR) – A DICOM object which contains measurement, calculations, diagnoses, image references, and other non-image information concerning a patient exam.

***syngo*® SC2000™ Workplace** – The workplace used with the ACUSON SC2000 system; also referred to as the SC2000 Workplace.

Tag – A 32-bit identifier for a data element, represented as a pair of four digit hexadecimal numbers, the "group" and the "element". If the "group" number is odd, the tag is for a private (manufacturer-specific) data element. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element].

Transfer Syntax – The encoding used for exchange of DICOM information objects and messages. Examples: *JPEG* compressed (images), little endian explicit value representation.

Unique Identifier (UID) – A globally unique "dotted decimal" string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID, SOP Instance UID.

Value Representation (VR) – The format type of an individual DICOM data element, such as text, an integer, a person's name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

1.4 Basics of DICOM Communication

This section describes terminology used in this Conformance Statement for the non-specialist. The key terms used in the Conformance Statement are highlighted in *italics* below. This section is not a substitute for training about DICOM, and it makes many simplifications about the meanings of DICOM terms.

Two *Application Entities* (devices) that want to communicate with each other over a network using DICOM protocol must first agree on several things during an initial network "handshake". One of the two devices must initiate an *Association* (a connection to the other device), and ask if specific services, information, and encoding can be supported by the other device (*Negotiation*).

DICOM specifies a number of network services and types of information objects, each of which is called an *Abstract Syntax* for the Negotiation. DICOM also specifies a variety of methods for encoding data, denoted *Transfer Syntaxes*. The Negotiation allows the initiating Application Entity to propose combinations of Abstract Syntax and Transfer Syntax to be used on the Association; these combinations are called *Presentation Contexts.* The receiving Application Entity accepts the Presentation Contexts it supports.

For each Presentation Context, the Association Negotiation also allows the devices to agree on *Roles* – which one is the *Service Class User* (SCU - client) and which is the *Service Class Provider* (SCP - server). Normally the device initiating the connection is the SCU, i.e., the client system calls the server, but not always.

The Association Negotiation finally enables exchange of maximum network packet (*PDU*) size, security information, and network service options (called *Extended Negotiation* information).

The Application Entities, having negotiated the Association parameters, may now commence exchanging data. Common data exchanges include queries for worklists and lists of stored images, transfer of image objects and analyses (structured reports), and sending images to film printers. Each exchangeable unit of data is formatted by the sender in accordance with the appropriate *Information Object Definition*, and sent using the negotiated Transfer Syntax. There is a Default Transfer Syntax that all systems must accept, but it may not be the most efficient for some use cases. Each transfer is explicitly acknowledged by the receiver with a *Response Status* indicating success, failure, or that query or retrieve operations are still in process.

Two Application Entities may also communicate with each other by exchanging media (such as a CD-R). Since there is no Association Negotiation possible, they both use a *Media Application Profile* that specifies “pre-negotiated” exchange media format, Abstract Syntax, and Transfer Syntax.

1.5 Abbreviations

ACR	American College of Radiology
AE	DICOM Application Entity
AET	DICOM Application Entity Title
ASCII	American Standard Code for Information Interchange
DB	Database
DCS	DICOM Conformance Statement
DSA	Digital Subtraction Angiography
IIDC	Image-Intensifier Distortion Correction
IOD	DICOM Information Object Definition
ISO	International Standard Organization
MPPS	Modality Performed Procedure Step
MWL	Modality Worklist
NEMA	National Electrical Manufacturers Association
O	Optional Key Attribute
PDU	DICOM Protocol Data Unit
R	Required Key Attribute
RIS	Radiology Information System
SC	Storage Commitment
SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM server)
SOP	DICOM Service-Object Pair
SR	Structured Report
U	Unique Key Attribute
US	Ultrasound

1.6 References

[1] DICOM® Standards Publication, PS 3.1-2008 – PS 3.18-2008, © NEMA. The DICOM Standard is under continuous maintenance. The current official version is available at http://dicom.nema.org.

[2] IHE Cardiology Technical Framework, Vol. I – II, http://www.ihe.net/Technical_Framework.

2 NETWORKING

This section contains the ACUSON SC2000 system networking related services.

2.1 Implementation Model

SC2000 users can store images directly on the system hard drive. Images can also be transferred to DICOM workstations and archive servers on a network. Storage Commitment can be used to insure that patient images and data is safely committed. Measurements from Cardiac exams can be exported as DICOM SR Objects. The system is capable of querying a HIS/RIS, using DICOM Basic Worklist Management Service, for a list of scheduled patient procedures. Measurements from Cardiac exams can be exported as DICOM SR Objects. Performed procedure status and other procedure information can be returned to the HIS/ RIS using Modality Performed Procedure Step (MPPS).

SC2000 Real World Activities are indicated by “Real World Activity” name while “SC2000 AE” indicates the invoked Application Entity. Similarly, the activities associated with service providers are indicated as “Real World Service Activity.”

2.1.1 Application Data Flow

Figure 2-1 and Figure 2-2 provide a functional overview of the SC2000’s Application Entities (AE). Relationships are shown between user-invoked activities (in the circles at the left of the AEs) and the associated real-world activities provided by DICOM service providers (in the circles at the right of the AEs).

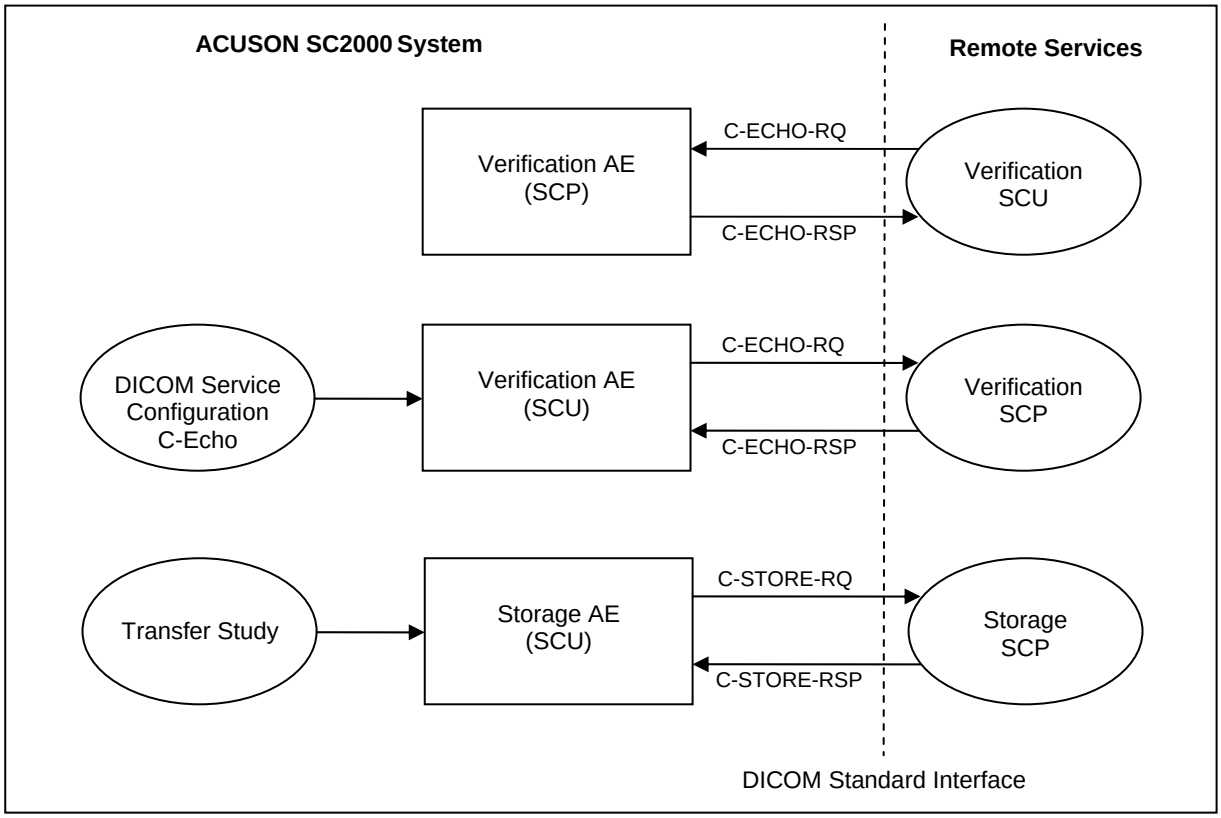

Figure 2-1. Functional Overview

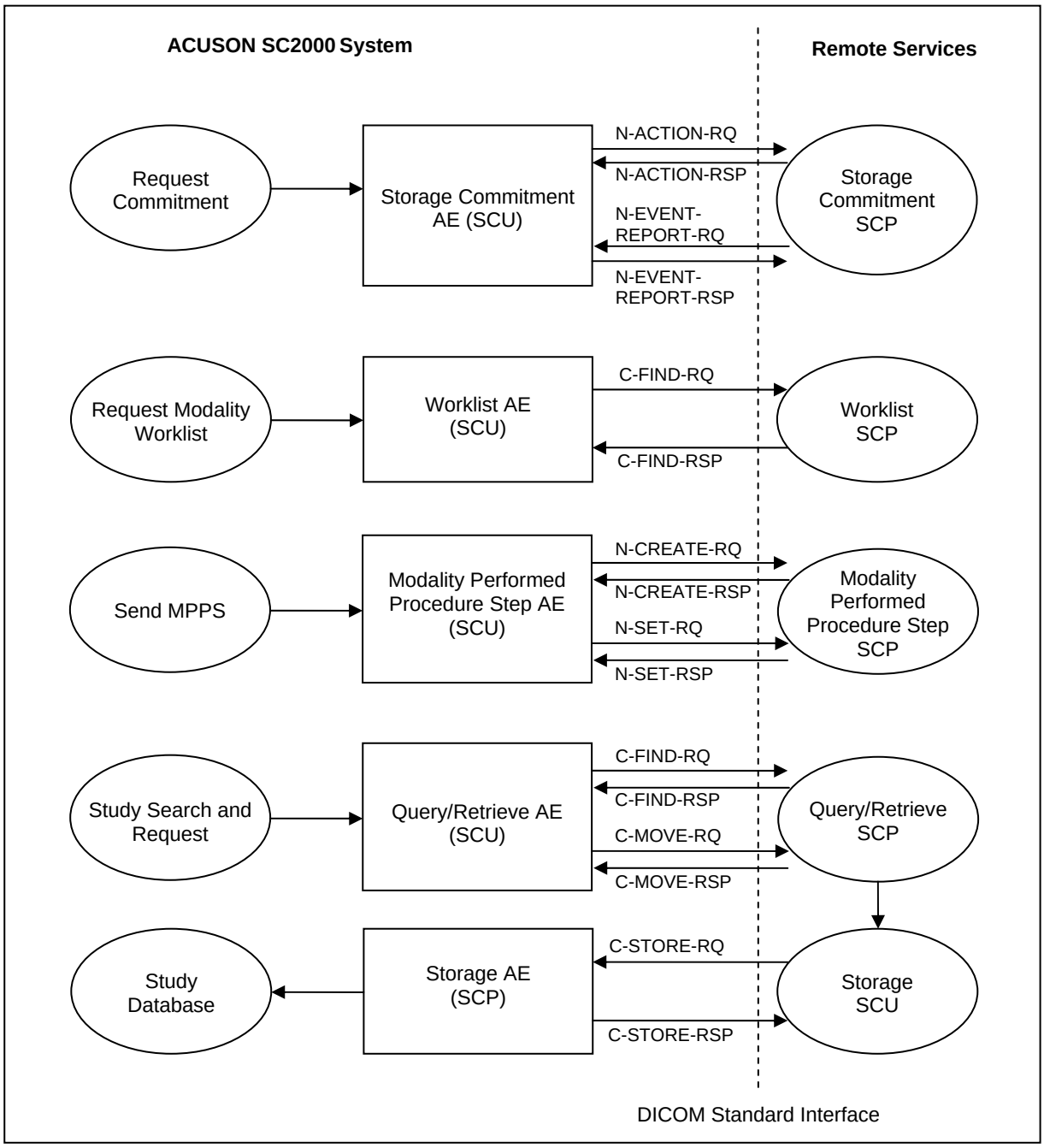

Figure 2-2. Functional Overview (Continued)

2.1.2 Functional Definition of AE's

The SCP components of the SC2000 operate as background server processes. They exist as soon as the system is powered up and wait for association requests. Upon accepting an association with a negotiated Presentation Context they start to receive and process the request described in the following sections.

2.1.2.1 Verification AE

The DICOM verification service can be used for diagnostic purposes. When used as a diagnostic tool, Verification will return the following messages to the user:

- C-Echo discovery result: Succeeded
- C-Echo discover result: Failed

Verification is available for each service configuration accessed through the Network/Printing pages of User Configuration:

- Store Configuration
- Storage Commitment Configuration
- Query Retrieve Configuration
- RIS Server Configuration (for Modality Worklist)

The SC2000 supports the Verification service as a SCP and SCU. As a SCU, Verification is activated when the C-Echo button is selected on a service configuration page.

2.1.2.2 Storage AE

The SC2000 acts as SCU and SCP for the C-STORE DICOM network service.

As an SCU, the SC2000 Storage Application Entity originates associations for transfer of DICOM Ultrasound single frame images, multi-frame images, raw data objects, and Comprehensive Structured Reports to remote Application Entities.

The system supports automatic and manual storage of captured objects. Manual transfers can be initiated through the export dialog on the Data View UI. If configured for automatic transfer, the system can either transfer objects “in progress” or “on study close”:

- The system automatically stores an image as soon as it is captured and saved to the local disk while the study is currently open and in-progress.
- The system automatically stores all the images belonging to the current study as it closes.
- The system automatically stores one or more studies in the background, acquired while in a portable non-networked mode, once it is powered up on the network.

The “in-progress” method distributes the network load over time and can provide image review at the review station in near real-time, provided the server supports this capability.

Note: Even when in-progress” method is configured, the system stores the SR objects only at end of study.

The “on study close” method lets the user store studies more accurately in the server. It is a common practice in Ultrasound to delete some images or modify demographic data before the study is closed.

In the event that the SC2000 is taken off the network as a portable system or when a network failure occurs during a background store, the Storage SCU maintains a queue of failed C-STORE requests. These are periodically retried subsequent to the end of the study. The queue is also retried upon power cycling of the SC2000.

The storage request consists of data describing the composite image objects selected for storage and the destination AET. An association is negotiated with the destination AE and the image data is transferred using the C-STORE DIMSE Service. The transfer status is reported to the initiator of the Storage request.

As an SCP, the SC2000 Application Entity accepts storage requests from configured DICOM nodes and stores received objects into the local database. The C-STORE DIMSE service is used for storing the images.

2.1.2.3 Storage Commitment AE

The SC2000 serves as a SCU for the DICOM Storage Commitment service. Upon successful completion of a storage job, the system uses the N-ACTION DIMSE Service to request storage commitment from a DICOM storage SCP. This can either be the same as the storage destination or storage commitment can be requested from a different server depending on the system configuration.

The user configures Storage Commitment from the Networking/Printing pages of the User Configuration. The SC2000 requests commitment of images and structured reports and, upon successful acknowledgement from the storage server, marks the study on the system hard drive as ”Archived” (AD). Storage Commitment Request is always sent in an additional Association.

2.1.2.4 Worklist AE

Patient registration can be automated by using the “Worklist” Real World Activity. Initiating the ‘New Patient’ function begins the patient data registration process and closes the previous active study. The worklist query runs in the background and the system will attempt to find all scheduled ultrasound patients. If no matches are found, a message will be presented to the user indicating so. If more than one matching patient is found, a list of matching entries will be presented to the user. Each of the fields will be sortable in ascending or descending order.

The user will have the option of selecting a patient study or canceling the operation. Selection of a patient from the list will cause all demographic information for that patient to be loaded in the patient registration screen.

2.1.2.5 Modality Performed Procedure Step AE

The SC2000 Modality Performed Procedure Step (MPPS) uses the DICOM 3.0 MPPS service class SCU to send event transactions that facilitate the transfer of procedure status and billing information from the ultrasound system to the information system. MPPS is triggered at the start of a study and at the end of a study. MPPS is also triggered when a study is restarted.

The MPPS SCU supports both the N-CREATE and N-SET DIMSE Service Elements. A different MPPS server can be configured separately from a Modality Worklist server.

2.1.2.6 Query/Retrieve AE

The query/retrieve service class defines an application-level class of services which facilitates the management of images and patient data against the well-defined information model of DICOM and allows a DICOM AE to retrieve images from a remote DICOM node or to request a remote DICOM AE to initiate a transfer of images to another DICOM AE. The SC2000 DICOM query/retrieve application supports the query/retrieve services as an SCU.

The Query SCU initiates a C-FIND request to the remote SCP and is invoked directly by the user, using the query parameters entered in the Data View UI. The remote SCP returns a list of responses with defined data, which are displayed to the user. The user can decide to start retrieval or to issue another query.

The SC2000 supports

- Study Root Query Model.

As the Move SCU, the system initiates a C-MOVE request to the remote Retrieve SCP. The remote Retrieve SCP in turn starts C-STORE suboperations to the Storage SCP.

2.1.3 Sequencing of Real-World Activities

This section describes the sequencing of Real-World Activities performed by the Application Entities using a UML sequence diagram. Real-World Activities are depicted as vertical bars and arrows show the events exchanged between them.

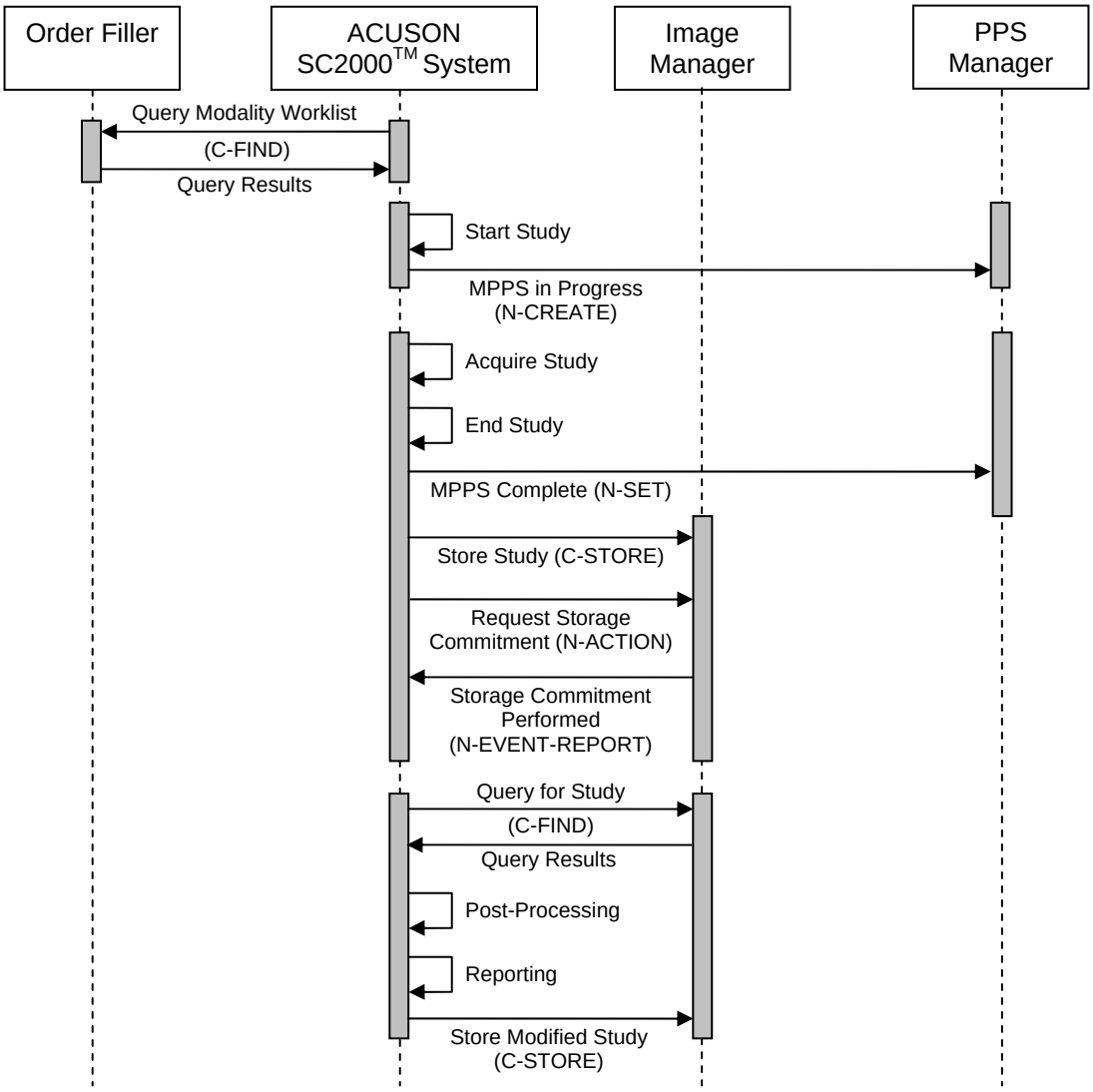

Figure 2-3. Sequence Diagram for Real-World Activities

2.2 AE Specifications

2.2.1 Storage AE

2.2.1.1 SOP Classes

Table 2-1:
SOP Classes for Storage AE

SOP Class Name	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)
Supported Storage SOP Classes			
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Yes	Yes
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Yes	Yes

2.2.1.2 Association Policies

2.2.1.2.1 General

Table 2-2:
DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

2.2.1.2.2 Number of Associations

Table 2-3:
Number of Associations as an Association Initiator for Storage AE

Maximum number of simultaneous associations	10

Table 2-4:
Number of Associations as an Association Acceptor for Storage AE

Maximum number of simultaneous associations	Configurable between 1 and 4, default: 4

2.2.1.2.3 Asynchronous Nature

The SC2000 supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side, the Window size proposed is infinite. On the SCP side, any non-infinite maximum size will be accepted.

Table 2-5:
Asynchronous Nature as an Association Initiator for Storage AE

Maximum number of outstanding asynchronous transactions	Infinite

2.2.1.2.4 Implementation Identifying Information

Table 2-6:
DICOM Implementation Class and Version for Storage AE

Implementation Class UID	1.3.12.2.1107.5.99.3.20080101
Implementation Version Name	SIEMENS

2.2.1.3 Association Initiation Policy (Storage SCU)

The SC2000 initiates associations while processing the service operations and internal messages as shown below.

Operation or Real-World Activity	Association for
Send Instance	C-STORE, C-ECHO

2.2.1.3.1 Activity "Send To"

2.2.1.3.1.1 Description and Sequencing of Activities

Storage of a DICOM object to an external entity is triggered by a C-STORE request initiated either automatically by the system or interactively (manually) by the user.

If an association to a remote Application Entity could successfully be established, each image will be transferred one after another via the same open association.

The automatic retry mechanism is configurable. The user can configure the number of retries as well as the time interval between two retries.

Retry is done if:

a) The network connection has been lost from the SCU perspective. In this case, retry is performed as soon as the network connection is available again.

b) The partner is not reachable for other reasons (e.g. partner node has broken down). For this case, a (global, configurable) timeout has been implemented after which retry is performed.

2.2.1.3.1.2 Proposed Presentation Contexts

For all supported images (see SOP Classes in Table 2-1: SOP Classes for Storage AE), the following Transfer Syntaxes are supported.

Table 2-7:
Store Presentation Context

Abstract Syntax		Transfer Syntax	
Name	**UID**	**Name List**	**UID List**
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		Explicit VR Big Endian	1.2.840.10008.1.2.2
		JPEG Lossless	1.2.840.10008.1.2.4.70
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
Ultrasound Multi-frame Image Storage (Clips)	1.2.840.10008.5.1.4.1.1.3.1	JPEG Lossy (Baseline)	1.2.840.10008.1.2.4.50
		Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
Ultrasound Raw Data Storage (3D volumetric data sets)	1.2.840.10008.5.1.4.1.1.66	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1

2.2.1.3.1.3 Photometric Interpretation

Photometric Interpretation (color mode of the pixel image data) is not a negotiable parameter in DICOM 3.0. The Photometric Interpretation Attribute (0028,0004) is set depending on the transfer syntax and the system configuration.

Table 2-8:
Photometric Interpretation

SOP Class		Transfer Syntax		Photometric Interpretation
Name	**UID**	**Name List**	**UID List**	
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	RGB
		Explicit VR Little Endian	1.2.840.10008.1.2.1	
		JPEG Lossless	1.2.840.10008.1.2.4.70	
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	RGB
		Explicit VR Little Endian	1.2.840.10008.1.2.1	
Ultrasound Multi-frame Image Storage (Clips)	1.2.840.10008.5.1.4.1.1.3.1	JPEG Lossy (Baseline)	1.2.840.10008.1.2.4.50	YBR_FULL_422
		Implicit VR Little Endian	1.2.840.10008.1.2	RGB

2.2.1.3.1.4 SOP Specific Conformance to SOP Classes

The SC2000 will not add or change private attributes, even if case objects are compressed or the image header is updated according to IHE [2] Patient Information Reconciliation.

Refer to section 6.1.1, Created SOP Instances, for a detailed list of attributes.

Table 2-9:
DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	Sending partially or completely failed	Any none null Code	Failure reported to user and storage job is cancelled. (percentage of transferred instances is shown)
Success	Image is successfully stored on file system.	0000	Success reported to user

Table 2-10:
DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	Failure reported to user (Timeout configurable; default 30s). The system retries according to the configured retry parameters.
Association Aborted	Failure reported to user and the storage job is cancelled.

2.2.1.4 Association Acceptance Policy

The SC2000 attempts to accept a new association for

- DIMSE C-STORE

service operations.

Generally, associations are accepted if all of the following conditions are true:

- The "called AET" matches one of the configured Application Entity Titles of the SC2000.
- The "calling AET" is allowed to connect to SC2000. This check can be disabled.
- The maximum number of incoming associations is not reached.
- At least one Proposed Presentation Context is supported.

If a Proposed Presentation Context contains more than one Transfer Syntax, the one in the following priority list is chosen (if applicable for the SOP class):

1) Explicit Value Representation Little Endian
2) Implicit Value Representation Little Endian
3) Explicit Value Representation Big Endian
4) JPEG Baseline (Process 1)
5) JPEG Extended (Process 2 & 4)
6) JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14)
7) JPEG 2000 Image Compression (Lossless Only)
8) JPEG 2000 Image Compression
9) RLE Lossless

2.2.1.4.1 Activity "Receive Instances"

2.2.1.4.1.1 Description and Sequencing of Activities

The SC2000 receiving process will accept an association, receive any images transmitted on that association and store the images on disk. It will store some header attributes in the database in order to allow clients to query these attributes.

2.2.1.4.1.2 Accepted Presentation Contexts

1.2.840.10008.1.2.2	Explicit Value Representation Big Endian
1.2.840.10008.1.2.1	Explicit Value Representation Little Endian
1.2.840.10008.1.2	Implicit Value Representation Little Endian: Default Transfer Syntax for DICOM
1.2.840.10008.1.2.4.91	JPEG 2000 Image Compression
1.2.840.10008.1.2.4.90	JPEG 2000 Image Compression (Lossless Only)
1.2.840.10008.1.2.4.50	JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression
1.2.840.10008.1.2.4.51	JPEG Extended (Process 2 & 4): Default Transfer Syntax for Lossy JPEG 12 Bit Image Compression (Process 4 only)
1.2.840.10008.1.2.4.70	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression
1.2.840.10008.1.2.5	RLE Lossless

2.2.1.4.1.3 SOP Specific Conformance to SOP Classes

In case of a successful C-STORE operation, the image has successfully been written on disk either in Explicit Little Endian format or in the compression format received.

The Storage AE of the SC2000 returns the status "success" when the data is stored to disk and a minimal image header validation has been performed.

The following header attributes must be available and filled:

- Patient Name,
- Study Instance UID,
- Series Instance UID and
- SOP Instance UID

Table 2-11:
Storage C-STORE Response Status

Service Status	Further Meaning	Error Code	Reason
Success	Success	0x0000	Image received correctly (success notification is done after receiving, before indexing and storing)

2.2.1.4.1.4 Other SOP Specific Behavior

- If an image is received that is already stored in the database – identified by the SOP Instance UID – the new image will be ignored. The existing instance is not superseded.
- The Patient Quadruplet (Patient's Name, Patient ID, Date of Birth, Patient Sex) is internally used for unique identification. The Patient ID is specified as a "type 2" attribute by DICOM. Therefore the attribute must be in the message but it may be empty. If the Patient ID is missing, it will be generated and inserted to the index by the SC2000 for internal purposes.

2.2.2 Storage Commitment AE

2.2.2.1 SOP Classes

Table 2-12:
SOP Classes for Storage Commitment AE

SOP Class Name	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)
Supported Storage Commitment SOP Classes			
Storage Commitment Push Model	1.2.840.10008.1.20.1	Yes	No

2.2.2.2 Association Policies

2.2.2.2.1 General

Table 2-13:
DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

2.2.2.2.2 Number of Associations

Table 2-14:
Number of Associations as an Association Initiator for Storage Commitment AE

Maximum number of simultaneous associations	Unlimited

Table 2-15:
Number of Associations as an Association Acceptor for Storage Commitment AE

Maximum number of simultaneous associations	Configurable between 1 and 4, default: 4

2.2.2.2.3 Asynchronous Nature

The SC2000 supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any non-infinite maximum size will be accepted.

Table 2-16:
Asynchronous Nature as an Association Initiator for Storage Commitment AE

Maximum number of outstanding asynchronous transactions	Infinite

2.2.2.2.4 Implementation Identifying Information

Table 2-17:
DICOM Implementation Class and Version for Storage Commitment AE

Implementation Class UID	1.3.12.2.1107.5.99.3.20080101
Implementation Version Name	SIEMENS

2.2.2.3 Association Initiation Policy (Storage Commitment SCU)

The SC2000 initiates associations while processing the service operations and internal messages as shown below.

Operation or Real-World Activity	Association for
Storage Commitment	N-ACTION N-EVENT-REPORT

2.2.2.3.1 Activity "Send Initial Storage Commitment"

2.2.2.3.1.1 Description and Sequencing of Activities

After Sending Images to the Archive, the SC2000 will initiate a Storage Commitment request if configured. The SC2000 initiates a new association in order to send the N-ACTION-RQ to the SCP.

2.2.2.3.1.2 Proposed Presentation Contexts

Table 2-18:
Proposed Presentation Contexts for Storage Commitment AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

There is no extended negotiation as an SCU.

2.2.2.3.1.3 SOP Specific Conformance to SOP Classes

Table 2-19:
DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	No Retry on Failure	Any none null Code	Failure reported to user
Success	Storage Commitment Reply noticed.	0000	Success reported to user

Table 2-20:
DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	Failure reported to user
Association Aborted	Failure reported to user

2.2.2.3.2 Activity "Send Reply to Commitment Requests on separate associations"

2.2.2.3.2.1 Description and Sequencing of Activities

The SC2000 system accepts the N-EVENT-REPORT-RQ on a separate association from the N-ACTION-RQ.

2.2.2.3.2.2 Proposed Presentation Contexts

Table 2-21:
Proposed Presentation Contexts for Storage Commitment AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

There is no extended negotiation as an SCU.

2.2.2.3.2.3 SOP Specific Conformance for SOP Classes

Table 2-22:
DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	Storage Commitment Reply ignored.	Any none null Code	Storage Commitment will not be repeated.
Success	Storage Commitment Reply noticed.	0000	Success reported to user.

There is no special failure behavior.

2.2.2.4 Association Acceptance Policy

Storage Commitment AE does not accept Association requests.

2.2.3 Query AE

2.2.3.1 SOP Classes

The SC2000 provides Standard Conformance to the following DICOM V3.0 SOP Classes as SCP/SCU.

Table 2-23:
SOP Classes for Query AE

SOP Class Name	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)
Supported Query SOP Classes			
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	No

2.2.3.2 Association Policies

2.2.3.2.1 General

Table 2-24:
DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

2.2.3.2.2 Number of Associations

Table 2-25:
Number of Associations as an Association Initiator for Query AE

Maximum number of simultaneous associations	Unlimited

Table 2-26:
Number of Associations as an Association Acceptor for Query AE

Maximum number of simultaneous associations	Configurable between 1 and 4, default: 4

2.2.3.2.3 Asynchronous Nature

The SC2000 supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any non-infinite maximum size will be accepted.

Table 2-27:
Asynchronous Nature as an Association Initiator for Query AE

Maximum number of outstanding asynchronous transactions	Infinite

2.2.3.2.4 Implementation Identifying Information

Table 2-28:
DICOM Implementation Class and Version for Query AE

Implementation Class UID	1.3.12.2.1107.5.99.3.20080101
Implementation Version Name	SIEMENS

2.2.3.3 Association Initiation Policy (Query SCU)

The SC2000 will initiate new associations for the following operations as an SCU.

Operation or Real–World Activity	Association for
Querying a Remote Node	C-FIND

2.2.3.3.1 Activity "Querying a Remote Node"

2.2.3.3.1.1 Description and Sequencing of Activities

The associated Real-World activity is a C-Find request initiated by the user of the SC2000. The user specifies some attributes the system should use to query its database. If the query user successfully establishes an association to the remote Application Entity, it will send a C-Find request (according to the query model) and will then return the results to the application.

2.2.3.3.1.2 Proposed Presentation Contexts

The SC2000 will propose Presentation Contexts as shown in the following table.

Table 2-29:
Proposed Presentation Contexts for Query AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Study Root Query/ Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	No

2.2.3.3.1.3 SOP Specific Conformance to SOP Classes

Refer to section 6.1.1, Created SOP Instances, for a detailed list of attributes.

The SC2000 checks for the following status codes in the Query SCP's C-Find-Response.

Table 2-30:
DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	No Auto Retry on failure	Any none null Code	Failure reported to user
Success	Success logged on the job queue	0000	Success reported to user

Table 2-31:
DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	Failure reported to user
Association Aborted	Failure reported to user

The SC2000 supports the following query levels:

- Study

2.2.3.4 Association Acceptance Policy

Query AE does not accept Association requests.

2.2.4 Retrieve AE

2.2.4.1 SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

Table 2-32:
SOP Classes for Retrieve AE

SOP Class Name	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)
Supported Query/Retrieve SOP Classes			
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes

2.2.4.2 Association Policies

2.2.4.2.1 General

Table 2-33:
DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

2.2.4.2.2 Number of Associations

Table 2-34:
Number of Associations as an Association Initiator for Retrieve AE

Maximum number of simultaneous associations	Unlimited

Table 2-35:
Number of Associations as an Association Acceptor for Retrieve AE

Maximum number of simultaneous associations	Configurable between 1 and 4, default: 4

2.2.4.2.3 Asynchronous Nature

The SC2000 supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP Side any non-infinite maximum size will be accepted.

Table 2-36:
Asynchronous Nature as an Association Initiator for Retrieve AE

Maximum number of outstanding asynchronous transactions	Infinite

2.2.4.2.4 Implementation Identifying Information

Table 2-37:
DICOM Implementation Class and Version for Retrieve AE

Implementation Class UID	1.3.12.2.1107.5.99.3.20080101
Implementation Version Name	SIEMENS

2.2.4.3 Association Initiation Policy

The SC2000 Retrieve AE sends a C-MOVE-RQ to an SCP node to retrieve images.

2.2.4.3.1 Activity "Move SCU"

2.2.4.3.1.1 Description and Sequencing of Activities

The C-MOVE-RQs are used to retrieve the referenced instances. The Retrieve AE supports the query model Study Root.

2.2.4.3.1.2 Accepted Presentation Contexts

Table 2-38:
Proposed Presentation Contexts for Retrieve AE and Activity MOVE SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Study Root Query/Retrieve Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	No

There is no extended negotiation as an SCU.

2.2.4.3.1.3 SOP Specific Conformance to Move SCU Classes

At association establishment time, the C-MOVE presentation context shall be negotiated. When the C-MOVE-RQ is processed, the Move Destination attribute (receiver of images) is ignored. However, the Move Destination AE must conform to the DICOM conventions (value representation AE).

Table 2-39:
DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	No Auto retry on failure	Any none null Code	Failure reported to user (percentage of transferred instances is shown)
Success	Success logged on the job queue	0000	Success reported to user

Table 2-40:
DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	Failure reported to user
Association Aborted	Failure reported to user

2.2.4.4 Association Acceptance Policy

Retrieve AE does not accept Association requests.

2.2.5 Worklist AE

2.2.5.1 SOP Classes

This Application Entity provides Standard Conformance to the SOP Classes listed in the table below.

Table 2-41:
SOP Classes for Worklist AE

SOP Class Name	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)
Supported Worklist SOP Classes			
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Yes	No

2.2.5.2 Association Policies

2.2.5.2.1 General

Table 2-42:
DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

2.2.5.2.2 Number of Associations

Table 2-43:
Number of Associations as an Association Initiator for Worklist AE

Maximum number of simultaneous associations	Unlimited

Table 2-44:
Number of Associations as an Association Acceptor for Worklist AE

Maximum number of simultaneous associations	Configurable between 1 and 4, default: 4

2.2.5.2.3 Asynchronous Nature

The SC2000 supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side the Window size proposed is infinite. On the SCP side, any non-infinite maximum size will be accepted.

Table 2-45:
Asynchronous Nature as an Association Initiator for Worklist AE

Maximum number of outstanding asynchronous transactions	Infinite

2.2.5.2.4 Implementation Identifying Information

Table 2-46:
DICOM Implementation Class and Version for Worklist AE

Implementation Class UID	1.3.12.2.1107.5.99.3.20080101
Implementation Version Name	SIEMENS

2.2.5.3 Association Initiation Policy

The SC2000 initiates associations while processing the service operations and internal messages as shown below.

Operation or Real-World Activity	Association for
Query for Modality Worklist	C-FIND

2.2.5.3.1 Activity "Querying a Remote Node"

2.2.5.3.1.1 Description and Sequencing of Activities

The associated Real-World activity is a C-Find request initiated by the user of the system. The user specifies some attributes which the remote Application should use to query its database. If the query user successfully establishes an association to the remote Application Entity, it will send a C-Find request (according to the query model) and will then return the results to the application.

2.2.5.3.1.2 Proposed Presentation Contexts

Table 2-47:
Proposed Presentation Contexts for Worklist AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Worklist-FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	No
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

There is no extended negotiation as an SCU.

2.2.5.3.1.3 SOP Specific Conformance to Modality Worklist Service SOP Class

The following table provides the list of user configurable matching attributes requested in the Broad Query of the Modality Worklist (C-FIND).
The broad query C-FIND-RQ is populated from the RIS Server configuration parameters. The broad query is always an automatic query, which is initiated by the system at intervals defined by the user, in the RIS Server configuration.

Table 2-48:
Modality Worklist Matching Key Attributes (Broad Query)

RIS Server Configuration	Attribute Name	Tag	Query Value
	Scheduled Procedure Step Sequence	(0040,0100)	
Scheduled Station	>Scheduled Station AE Title	(0040,0001)	Is equal to the "Scheduled Station" setting in the RIS Server advanced configuration menu.

RIS Server Configuration	Attribute Name	Tag	Query Value
SPS Start Date Interval	>Scheduled Procedure Step Start Date	(0040,0002)	Today's date or user specified date range
Modality	>Modality	(0008,0060)	Is equal to the "Modality" setting in the RIS Server advanced configuration menu.

The following table provides the list of user configurable matching attributes requested in the Patient based Query of the Modality Worklist (C-FIND).
The patient based query C-FIND-RQ is populated from the query parameters specified for a particular RIS server on SC2000 Data View. The patient based query is interactively (manually) initiated by the user, after selecting the RIS server from the Data view "look in" drop down field and populating at least one of the Worklist Data View fields defined in the table below.

Table 2-49:
Modality Worklist Matching Key Attributes (Patient Based Query)

Worklist Data View Field	Attribute Name	Tag	Query Value
Requested Procedure ID	Requested Procedure ID	(0040,1001)	As entered in the "Worklist Data View" UI - Requested Procedure ID.
Accession Number	Accession Number	(0008,0050)	As entered in the "Worklist Data View" UI - Accession Number.
Patient's Name	Patient's Name	(0010,0010)	As entered in the "Worklist Data View" UI - Patient's Name.
Patient ID	Patient ID	(0010,0020)	As entered in the "Worklist Data View" UI - Patient ID.
Scheduled Start Date	Scheduled Procedure Step Sequence >Scheduled Procedure Step Start Date	(0040,0100) >(0040,0002)	As entered in the "Worklist Data View" UI - Scheduled Start Date.
Modality	Scheduled Procedure Step Sequence >Modality	(0040,0100) >(0008,0060)	As entered in the "Worklist Data View" UI - "Modality".
Station AE Title	Scheduled Procedure Step Sequence >Scheduled Station AE Title	(0040,0100) >(0040,0001)	As entered in the "Worklist Data View" UI - "Scheduled Station".

Return Key Attributes used from the Worklist C_FIND_RSP

The ACUSON SC2000 system DICOM worklist SCU supports worklist queries with return key attributes of all types. The following table describes the return keys that the SCU supports or are needed to display the results on the Worklist view. Most attributes can be shown in the User Interface; Patient Registration or Data View. Attributes displayed on the Data View are configurable.

Note: SC2000 system will not display any of the query results, if even one of the results does not conform to the "Return Key Type" column according to the DICOM standard, in the table below. This means that the returning worklist results need to have all the Type 1 and Type 1C populated, for the SC2000 to be able to display the returned results. The returning Type 2 and 2C tags could remain empty, but need to be present. Type 3 tags are not mandatory.

Table 2-50:
Modality Worklist C_FIND_RSP Return Key Attributes

Attribute Name	Tag	Return Key Type	Displayable on UI
SOP Common			
Specific Character Set	(0008,0005)	1C	No
Scheduled Procedure Step			
Scheduled Procedure Step Sequence	(0040,0100)	1	
>Scheduled Station AE Title	(0040,0001)	1	Yes
>Scheduled Procedure Step Start Date	(0040,0002)	1	Yes
>Scheduled Procedure Step Start Time	(0040,0003)	1	Yes
>Scheduled Procedure Step End Date	(0040,0004)	3	Yes
>Scheduled Procedure Step End Time	(0040,0005)	3	No
>Modality	(0008,0060)	1	Yes
>Scheduled Performing Physician's Name	(0040,0006)	2	Yes
>Scheduled Procedure Step Description	(0040,0007)	1C	Yes
>Scheduled Station Name	(0040,0010)	2	Yes
>Scheduled Procedure Step Location	(0040,0011)	2	Yes
>Scheduled Protocol Code Sequence	(0040,0008)	1C	Yes
>>Code Value	(0008,0100)	1C	Yes
>>Coding Scheme Designator	(0008,0102)	1C	Yes
>>Coding Scheme Version	(0008,0103)	3	Yes
>>Code Meaning	(0008,0104)	3	Yes
>Pre-Medication	(0040,0012)	2C	Yes
>Scheduled Procedure Step ID	(0040,0009)	1	Yes
>Requested Contrast Agent	(0032,1070)	2C	Yes
>Scheduled Procedure Step Status	(0040,0020)	3	No
>Comments on the Scheduled Procedure Step	(0040,0400)	3	Yes
Requested Procedure			
Requested Procedure ID	(0040,1001)	1	Yes
Requested Procedure Description	(0032,1060)	1C	Yes
Requested Procedure Code Sequence	(0032,1064)	1C	
>Code Value	(0008,0100)	1C	Yes
>Code Scheme Designator	(0008,0102)	1C	Yes
>Code Scheme Version	(0008,0103)	3	Yes
>Code Meaning	(0008,0104)	3	Yes

Attribute Name	Tag	Return Key Type	Displayable on UI
Study Instance UID	(0020,000D)	1	No
Referenced Study Sequence	(0008,1110)	2	
>Referenced SOP Class UID	(0008,1150)	1C	No
>Referenced SOP Instance UID	(0008,1155)	1C	No
Requested Procedure Priority	(0040,1003)	2	Yes
Patient Transport Arrangements	(0040,1004)	2	Yes
Reason for the Requested Procedure	(0040,1002)	3	Yes
Confidentiality Code	(0040,1008)	3	Yes
Reporting Priority	(0040,1009)	3	No
Names of Intended Recipients of Results	(0040,1010)	3	Yes
Requested Procedure Comments	(0040,1400)	3	Yes
Requested Procedure Location	(0040,1005)	3	Yes
Imaging Service Request			
Accession Number	(0008,0050)	2	Yes
Requesting Physician	(0032,1032)	2	Yes
Referring Physician's Name	(0008,0090)	2	Yes
Reason for the Imaging Service Request	(0040,2001)	3	No
Imaging Service Request Comments	(0040,2400)	3	Yes
Requesting Service	(0032,1033)	3	Yes
Issuing Date of Imaging Service Request	(0040,2004)	3	No
Issuing Time of Imaging Service Request	(0040,2005)	3	No
Placer Order Number / Imaging Service Request	(0040,2016)	3	No
Filler Order Number / Imaging Service Request	(0040,2017)	3	No
Order entered by...	(0040,2008)	3	Yes
Order Enterer's Location	(0040,2009)	3	Yes
Order Callback Phone Number	(0040,2010)	3	No
Visit Identification			
Admission ID	(0038,0010)	2	Yes
Issuer of Admission ID	(0038,0011)	3	Yes
Visit Status			
Current Patient Location	(0038,0300)	2	Yes
Visit Relationship			
Referenced Patient Sequence	(0008,1120)	2	
>Referenced SOP Class UID	(0008,1150)	2	No
>Referenced SOP Instance UID	(0008,1155)	2	No

Attribute Name	Tag	Return Key Type	Displayable on UI
Visit Admission			
Institution Name	(0008,0080)	3	Yes
Admitting Diagnoses Description	(0008,1080)	3	Yes
Patient Identification			
Patient's Name	(0010,0010)	1	Yes
Patient ID	(0010,0020)	1	Yes
Other Patient IDs	(0010,1000)	3	Yes
Other Patient Names	(0010,1001)	3	Yes
Patient Demographic			
Patients Birth Date	(0010,0030)	2	Yes
Patient's Sex	(0010,0040)	2	Yes
Patient's Primary Language Code Sequence	(0010,0101)	3	
>Code Value	(0008,0100)	1	Yes
>Coding Scheme Designator	(0008,0102)	1	Yes
>Code Meaning	(0008,0104)	1	Yes
>Patient's Primary Language Code Modifier Sequence	(0010,0102)	3	Yes
>>Code Value	(0008,0100)	1	Yes
>>Coding Scheme Designator	(0008,0102)	1	Yes
>>Code Meaning	(0008,0104)	1	Yes
Patient's Size	(0010,1020)	3	Yes
Patient's Weight	(0010,1030)	2	Yes
Confidentiality constraint on patient data	(0040,3001)	2	Yes
Patient's Address	(0010,1040)	3	No
Military Rank	(0010,1080)	3	Yes
Ethnic Group	(0010,2160)	3	Yes
Patient Comments	(0010,4000)	3	Yes
Patient Medical			
Patient State	(0038,0500)	2	Yes
Pregnancy Status	(0010,21C0)	2	Yes
Medical Alerts	(0010,2000)	2	Yes
Contrast Allergies	(0010,2110)	2	Yes
Special Needs	(0038,0050)	2	Yes
Smoking Status	(0010,21A0)	3	Yes
Last Menstrual Date	(0010,21D0)	3	Yes
Additional Patient History	(0010,21B0)	3	Yes

2.2.5.3.1.4 SOP Specific Conformance to SOP Classes

Refer to section 6.1.1, Created SOP Instances, for a detailed list of attributes.

Table 2-51:
DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Error	Error not logged to the job queue	Any none null Code	No Failure reported to user
Success	Success not logged to the job queue	0000	Success reported to user

Table 2-52:
DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	Failure not reported to user
Association Aborted	Failure not reported to user

2.2.5.4 Association Acceptance Policy

Worklist AE does not accept Association requests.

2.2.6 MPPS AE

2.2.6.1 SOP Classes

This Application Entity provides Standard Conformance to the SOP Classes listed in the table below.

Table 2-53:
SOP Classes for MPPS

SOP Class Name	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)
Supported MPPS SOP Classes			
MPPS (N-Create, N-Set)	1.2.840.10008. 3.1.2.3.3	Yes	No

2.2.6.2 Association Policies

2.2.6.2.1 General

Table 2-54:
DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

2.2.6.2.2 Number of Associations

Table 2-55:
Number of Associations as an Association Initiator for MPPS AE

Maximum number of simultaneous associations	Unlimited

2.2.6.2.3 Asynchronous Nature

The SC2000 supports asynchronous communication (multiple outstanding transactions over a single association). On the SCU side, the Window size proposed is infinite.

2.2.6.2.4 Implementation Identifying Information

Table 2-56:
DICOM Implementation Class and Version for MPPS AE

Implementation Class UID	1.3.12.2.1107.5.99.3.20080101
Implementation Version Name	SIEMENS

2.2.6.3 Association Initiation Policy

SC2000 initiates associations while processing the service operations and internal messages as shown below.

Operation or Real-World Activity	Association for
DIMSE N-CREATE, N-SET (forwarding MPPS)	N-CREATE, N-SET

2.2.6.3.1 Activity "Send MPPS"

2.2.6.3.1.1 Description and Sequencing of Activities

The SC2000 supports the DICOM Modality Performed Procedure Step Service as an SCU. The Modality Performed Procedure Step SCU informs the Performed Procedure Step SCP about the procedure performed at the modality using the N-CREATE and N-SET DIMSE service.

Immediately after a new patient, study, or scheduled procedure is registered (via Patient Registration), the SC2000 automatically performs an MPPS N-CREATE-RQ operation with a status of IN-PROGRESS for the newly created Performed Procedure Step. When the current patient procedure ends (either with an

End Exam, or new Patient / Study / Procedure), the SC2000 automatically performs an MPPS N-SET-RQ final operation with a status of COMPLETED. The user may also manually complete or discontinue the current Performed Procedure Step. An MPPS N-SET-RQ final operation is performed with the appropriate status of COMPLETED or DISCONTINUED.

2.2.6.3.1.2 Proposed Presentation Contexts

Table 2-57:
Proposed Presentation Contexts for MPPS AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Modality Performed Procedure Step	1.2.840.10008.3.1. 2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

There is no extended negotiation as an SCU.

2.2.6.3.1.3 SOP Specific Conformance to SOP classes

All Attributes listed in DICOM PS3.4 in Table F8.2-1 are potentially supported the SC2000. They will be part of the MPPS Message if set by the Application triggering the Service.

Refer to section 6.1.1, Created SOP Instances, for a detailed list of attributes.

Table 2-58:
DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Failure	No Auto retry of failed jobs	Any none null Code	Failure not reported to user
Success	Success not logged to the job queue	0000	Success reported to user

Table 2-59:
DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	Failure reported to user
Association Aborted	Failure reported to user

2.2.6.4 Association Acceptance Policy

MPPS AE does not accept Association requests.

2.3 Network Interfaces

2.3.1 Physical Network Interface

The SC2000 is independent from the physical medium over which TCP/IP executes; it inherits this from the OS system upon which it executes.

2.3.2 Additional Protocols

None.

2.3.3 IPv4 and IPv6 Support

IPv4 supported, IPv6 not supported.

2.4 Configuration

DICOM and networking parameters can be configured for both the local SC2000 and remote DICOM Service Class Providers through the User Configuration – Networking/Printing pages.

2.4.1 Local Host - TCP/IP and General

The SC2000's local network parameters are configurable. The following parameters can be configured for the SC2000:

- Host Name
- IP address
- Network IP mask
- Router/Gateway IP addresses
- DICOM Storage and HIS/RIS SCU Application Entity Titles
- Printers

2.4.1.1 DICOM Storage Configuration

Remote DICOM Storage and Storage Commitment Service Class Providers are configured through the Store Configuration or Storage Commitment Configuration of the User Configuration – Networking/Printing pages. The following parameters can be configured for each device:

- Host name
- IP address
- AET - Application Entity Title
- Port number
- Proposed transfer syntaxes

2.4.1.2 DICOM HIS/RIS Configuration

Remote DICOM Worklist and Modality Performed Procedure Step Service Class Providers are configured through the RIS Server Configuration of the User Configuration – Networking/Printing pages. The following parameters can be configured for each Worklist/MPPS server:

- Host name
- IP address
- AET - Application Entity Title
- Port number
- Query waiting time (in seconds)

- Maximum number of matching results
- Automatic Worklist query interval (in minutes)
- Modality
- Scheduled Procedure Step Date
- Station Name

3 MEDIA INTERCHANGE

3.1 Implementation Models

3.1.1 Application Data Flow Diagram

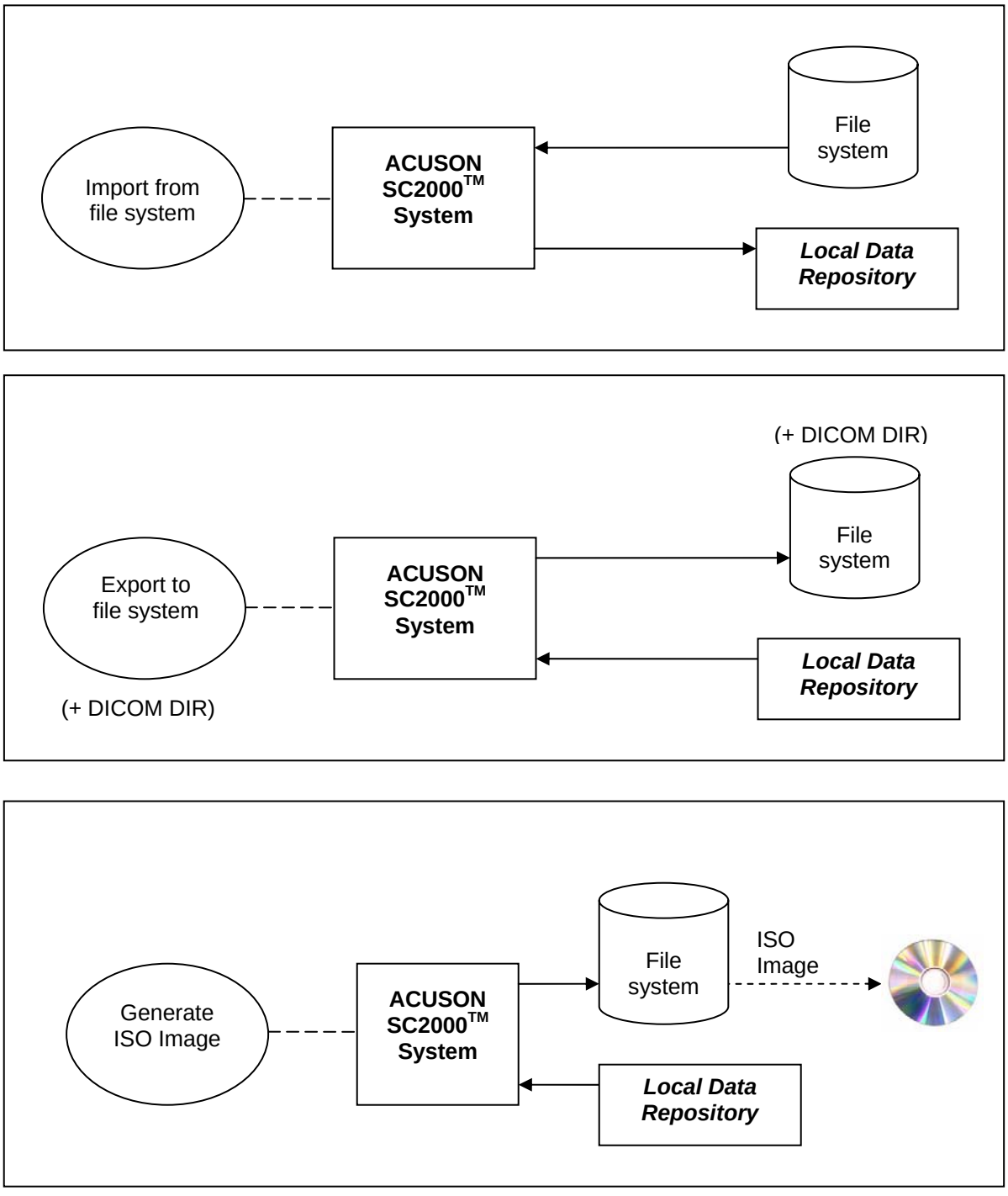

Figure 3-1. Media Application Data Flow Diagram

The SC2000 provides the functionality to Import or Export DICOM Instances to and from the File System. During exportation, a DICOMDIR may also be generated. A complete ISO Image ready-to-burn can be generated. All SOP Classes defined in Table 2-1: SOP Classes for Storage AE are supported for the Import/Export functionality.

3.1.2 Functional definitions of AEs

The SC2000 is capable of

- creating a new File-set in the File System (Export to ...)
- importing SOP Instances from the File System onto local storage

3.1.3 Sequencing of Real-World Activities

Not applicable.

3.1.4 File Meta Information for Implementation Class and Version

Table 3-1:
Implementation Class/Version Name – Media Interchange

File Meta Information Version	0x0001
Implementation Class UID	1.3.12.2.1107.5.99.3.20080101
Implementation Version Name	SIEMENS

3.2 AE Specifications

3.2.1 Media Storage AE Specification

The SC2000 system Media Storage AE provides conformance to the following DICOM SOP Classes as an FSC. The following specifications apply to the AE.

When configuring an uncompressed Transfer Syntax, the STD-US and STD-GEN application profile classes will be extended to store instances of the following SOP classes in compressed format.

Table 3-2:
Application Profiles, Activities, and Roles for DICOM Exchange Media

Application Profiles Supported	Real World Activity	Role
STD-GEN-CDR STD-US-SC-MF-CDR STD-US-ID-MF-CDR	Create CD-R	FSC/FSU

3.2.2 Implementation Identifying Information

Table 3-3:
DICOM Implementation Class and Version for Media Storage AE

Implementation Class UID	1.3.12.2.1107.5.9.20080101
Implementation Version Name	SIEMENS

3.3 Media Storage Application Profile

3.3.1 DICOMDIR Keys

The DICOMDIR file will contain the following attributes for the levels Patient - Study - Series - Image (valid for all Application profiles described in this section).

Table 3-4:
DICOMDIR Keys

Attribute Name	Tag	Type	Notes
File-Set Identification			
File-set ID	(0004,1130)	2	Volume label of media
Directory Information			
Offset of the First Directory Record of the Root Directory Entry	(0004,1200)	1	
Offset of the Last Directory Record of the Root Directory Entity	(0004,1202)	1	
File-set Consistency Flag	(0004,1212)	1	0000H
Directory Record Sequence	(0004,1220)	2	
> Offset of the Next Directory Record	(0004,1400)	1C	
> Record In-use flag	(0004,1410)	1C	FFFFH
> Offset of Referenced Lower-Level Directory Entity	(0004,1420)	1C	
> Directory Record Type	(0004,1430)	1C	PATIENT, STUDY, SERIES, IMAGE, SR DOCUMENT, RAW DATA
> Referenced File ID	(0004,1500)	1C	contains the filename on media for the Directory Records of Type IMAGE, SR DOCUMENT, RAW DATA
> Referenced SOP Class UID in File	(0004,1510)	1C	for the Directory Records of Type IMAGE, SR DOCUMENT, RAW DATA
> Referenced SOP Instance UID in File	(0004,1511)	1C	for the Directory Records of Type IMAGE, SR DOCUMENT, RAW DATA
> Referenced Transfer Syntax UID in File	(0004,1512)	1C	for the Directory Records of Type IMAGE, SR DOCUMENT, RAW DATA
> Record Selection Keys	see below		

Attribute Name	Tag	Type	Notes
Patient Keys			**Directory Record Type PATIENT**
Specific Character Set	(0008,0005)	1C	
Patient's Name	(0010,0010)	2	
Patient ID	(0010,0020)	1	
Date Of Birth	(0010,0030)	3	
Patient's Sex	(0010,0040)	3	
Study Keys			**Directory Record Type STUDY**
Specific Character Set	(0008,0005)	1C	
Study Date	(0008,0020)	1	
Study Time	(0008,0030)	1	
Accession Number	(0008,0050)	2	
Study Description	(0008,1030)	2	
Study Instance UID	(0020,000D)	1C	
Study ID	(0020,0010)	1	Will be generated automatically, if not present. Value = "-"
Series Keys			**Directory Record Type SERIES**
Specific Character Set	(0008,0005)	1C	
Series Date	(0008,0021)	3	
Series Time	(0008,0031)	3	
Modality	(0008,0060)	1	
Institution name	(0008,0080)	3	
Institution Address	(0008,0081)	3	
Performing Physician's Name	(0008,1050)	3	
Series Instance UID	(0020,000E)	1	
Series Number	(0020,0011)	1	
Image Keys			**Directory Record Type IMAGE**
Specific Character Set	(0008,0005)	1C	
Image Type	(0008,0008)	3	
SOP Class UID	(0008,0016)	3	
SOP Instance UID	(0008,0018)	3	
Content Date	(0008,0023)	3	
Content Time	(0008,0033)	3	
Acquisition Number	(0020,0012)	3	
Instance Number	(0020,0013)	1	
Rows	(0028,0010)	3	
Columns	(0028,0011)	3	
Image Position Patient	(0020,0032)	3	
Image Orientation Patient	(0020,0037)	3	
Frame of Reference UID	(0020,0052)	1C	
Pixel Spacing	(0028,0030)	3	
Calibration Image	(0050,0004)	3	

Attribute Name	Tag	Type	Notes
SR Document Keys			**Directory Record Type SR Document**
Specific Character Set	(0008,0005)	1C	
Content Date	(0008,0023)	1	
Content Time	(0008,0033)	1	
Instance Number	(0020,0013)	1	
Verification DateTime	(0040,A030)	1C	
Concept Name Code Sequence	(0040,A043)	1	
>Include Code Sequence Macro			
Completion Flag	(0040,A491)	1	
Verification Flag	(0040,A493)	1	
Raw Data Keys			**Directory Record Type RAW DATA**
Specific Character Set	(0008,0005)	1C	
Image Type	(0008,0008)	3	
SOP Class UID	(0008,0016)	3	
SOP Instance UID	(0008,0018)	3	
Content Date	(0008,0023)	3	
Content Time	(0008,0033)	3	
Acquisition Number	(0020,0012)	3	
Instance Number	(0020,0013)	1	

3.3.2 Compliance to STD-GEN-CDR

The SC2000 conforms to the STD-GEN-CDR profile. The following SOP Classes will be supported as an FSC.

Table 3-5:
STD-GEN-CDR Supported SOP Classes

IOD	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian	Yes	No	No

3.3.3 Compliance to STD-US-SC-MF-CDR

For media conforming to the STD-US-SC-MF-CDR profiles the following SOP Classes and transfer syntaxes will be supported as an FSC.

Table 3-6:
STD-US-SC-MF-CDR Supported SOP Classes

IOD	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
Ultrasound Multi-frame Image Storage (Clips)	1.2.840.10008.5.1.4.1.1.3.1	JPEG Lossy (Baseline) 1.2.840.10008.1.2.4.50	Yes	No	No

The following Photometric Interpretations are supported by FSC:

- RGB - Ultrasound Image Storage only
- YBR_FULL_422 - Ultrasound Multi-frame Image Storage (Clips) only

3.3.4 Compliance to STD-US-ID-MF-CDR

For media conforming to the STD-US-ID-MF-CDR profiles the following SOP Classes and transfer syntaxes will be supported as an FSC.

Table 3-7:
STD-US-MF-CDR Supported SOP Classes

IOD	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Explicit VR Little Endian 1.2.840.10008.1.2.1	Yes	No	No

4 SUPPORT OF CHARACTER SETS

4.1 Character Sets for ACUSON SC2000 System

The ACUSON SC2000 system supports the ISO 8859 Latin 1 (ISO-IR 100) character set.

5 SECURITY

5.1 Security Profiles

- PS 3.15 Annex F: Network Address Management Profiles: DHCP Client, DNS Client supported
- PS 3.15 Annex G: Time Synchronization Profiles supported

5.2 Association Level Security

It is possible to configure whether the DICOM Server will only answer to known AETs or to any AET.

5.3 Application Level Security

- For configuration and maintenance, the Service Technician must login with a separate password.

6 ANNEXES

6.1 IOD Contents

6.1.1 Created SOP Instances

6.1.1.1 US Image IOD Attributes

Module	Attribute	Tag	Type	Notes
Patient	Patient's Name	(0010,0010)	2	From MWL or user input
	Patient ID	(0010,0020)	2	From MWL or user input
	Patient's Birth Date	(0010,0030)	2	From MWL or user input
	Patient's Sex	(0010,0040)	2	From MWL or user input
General Study	Study Instance UID	(0020,000D)	1	From MWL or created
	Study Date	(0008,0020)	2	From MWL or created
	Study Time	(0008,0030)	2	Created
	Referring Physician's Name	(0008,0090)	2	From MWL or user input
	Study ID	(0020,0010)	2	Created
	Accession Number	(0008,0050)	2	From MWL or user input
	Study Description	(0008,1030)	3	From MWL (requested procedure description) or user selected
	Referenced Study Sequence	(0008,1110)	3	From MWL or zero length
	>Referenced SOP Class UID	(0008,1150)	1C	
	>Referenced SOP Instance UID	(0008,1155)	1C	
Patient Study	Patient's Age	(0010,1010)	3	From MWL or user input
	Patient's Size	(0010,1020)	3	From MWL or user input
	Patient's Weight	(0010,1030)	3	From MWL or user input
General Series	Modality	(0008,0060)	1	Set to US
	Series Instance UID	(0020,000E)	1	Created
	Series Number	(0020,0011)	2	Set to 1...n
	Protocol Name	(0018,1030)	3	
	Operators' Name	(0008,1070)	3	User input
	Referenced Performed Procedure Step Sequence	(0008,1111)	3	Created (if MPPS is supported)
	>Referenced SOP Class UID	(0008,1150)	1C	1.2.840.10008.3.1.2.3.3 (MPPS SOP Class)
	>Referenced SOP Instance UID	(0008,1155)	1C	MPPS SOP Instance UID
	Request Attributes Sequence	(0040,0275)	3	From MWL or zero length
	>Requested Procedure ID	(0040,1001)	1C	
	>Requested Procedure Description	(0032,1060)	3	
	>Scheduled Procedure Step ID	(0040,0009)	1C	
	>Scheduled Protocol Code Sequence	(0040,0008)	3	
	>>Include ‘Code Sequence Macro’			
	Performed Protocol Code Sequence	(0040,0260)	3	
General Equipment	Manufacturer	(0008,0070)	2	Set to “SIEMENS”
	Institution Name	(0008,0080)	3	From MWL or user selected

Module	Attribute	Tag	Type	Notes
	Station Name	(0008,1010)	3	Set to the computer's host name
	Institutional Department Name	(0008,1040)	3	
	Manufacturer's Model Name	(0008,1090)	3	Set to "ACUSON SC2000"
	Device Serial Number	(0018,1000)	3	Set to system serial number
	Software Versions	(0018,1020)	3	Set to "VA16D" or "VA16E"
General Image	Instance Number	(0020,0013)	2	1...n
	Patient Orientation	(0020,0020)	2C	Set to zero length
	Content Date	(0008,0023)	2C	Created
	Content Time	(0008,0033)	2C	Created
	Acquisition Date	(0008,0022)	3	Created
	Acquisition Time	(0008,0032)	3	Created
	Derivation Description	(0008,2111)	3	
Image Pixel	Rows	(0028,0010)	1	Set to 768
	Columns	(0028,0011)	1	Set to 1024
	Pixel Data	(7FE0,0010)	1	
US Region Calibration	Sequence of Ultrasound Regions	(0018,6011)	1	One created for each US region displayed
	>Region Location Min x0	(0018,6018)	1	
	>Region Location Min y0	(0018,601A)	1	
	>Region Location Max x1	(0018,601C)	1	
	>Region Location Max y1	(0018,601E)	1	
	>Physical Units X Direction	(0018,6024)	1	
	>Physical Units Y Direction	(0018,6026)	1	
	>Physical Delta X	(0018,602C)	1	
	>Physical Delta Y	(0018,602E)	1	
	>Reference Pixel x0	(0018,6020)	3	
	>Reference Pixel y0	(0018,6022)	3	
	>Ref. Pixel Physical Value X	(0018,6028)	3	
	>Ref. Pixel Physical Value Y	(0018,602A)	3	
	>Region Spatial Format	(0018,6012)	1	
	>Region Data Type	(0018,6014)	1	
	>Region Flags	(0018,6016)	1	
	>Doppler Correction Angle	(0018,6034)	3	Doppler regions only
US Image	Samples Per Pixel	(0028,0002)	1	Set to 3.
	Photometric Interpretation	(0028,0004)	1	See Table 2-8
	Bits Allocated	(0028,0100)	1	Set to 8
	Bits Stored	(0028,0101)	1	Set to 8
	High Bit	(0028,0102)	1	Set to 7
	Planar Configuration	(0028,0006)	1C	Set to 0 (color-by-pixel)
	Pixel Representation	(0028,0103)	1	Set to 0 (unsigned integer)
	Image Type	(0008,0008)	2	Normally DERIVED\PRIMARY\INTRACARDIAC\<nnnn>
	Lossy Image Compression	(0028,2110)	1C	= 01 if compressed
	R Wave Time Vector	(0018,6060)	3	
	Heart Rate	(0018,1088)	3	
	Transducer Data	(0018,5010)	3	Probe name

Module	Attribute	Tag	Type	Notes
	Transducer Type	(0018,6031)	3	
	Focus Depth	(0018,5012)	3	
	Mechanical Index	(0018,5022)	3	
SOP Common	SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.1.6.1
	SOP Instance UID	(0008,0018)	1	Created
	Specific Character Set	(0008,0005)	1C	From MWL or set to ISO_IR 100
	Instance Creation Date	(0008,0012)	3	Created
	Instance Creation Time	(0008,0013)	3	Created
Standard Extended SOP Class – Standard and Private Attributes				
General Study	Performed Procedure Step ID	(0040,0253)	3	Created (if MPPS is supported)
	Performed Procedure Step Start Date	(0040,0244)	3	
	Performed Procedure Step Start Time	(0040,0245)	3	
	Performed Procedure Step Description	(0040,0254)	3	
Image Pixel	Pixel Spacing	(0028,0030)	1C	
Private	Private Creator Data Element (Implementor)	(0119,0010)	3	Set to “SIEMENS Ultrasound SC2000”
	Volume Rate	(0119,1013)	3	
Private	Private Creator Data Element (Implementor)	(0139,0010)	3	Set to “SIEMENS Ultrasound SC2000”
Private	Private Creator Data Element (Implementor)	(0009,0010)	3	Set to “ACUSON:1.2.840.113680.1.0:0910”
	Custom Field 1	(0009,1002)	3	Values entered by user on Patient Registration Field : Custom Field 1
	Custom Field 2	(0009,1003)	3	Values entered by user on Patient Registration Field : Custom Field 2

6.1.1.2 US Multi-frame Image IOD Attributes

Module	Attribute	Tag	Type	Notes
Patient	Patient's Name	(0010,0010)	2	From MWL or user input
	Patient ID	(0010,0020)	2	From MWL or user input
	Patient's Birth Date	(0010,0030)	2	From MWL or user input
	Patient's Sex	(0010,0040)	2	From MWL or user input
General Study	Study Instance UID	(0020,000D)	1	From MWL or created
	Study Date	(0008,0020)	2	From MWL or created
	Study Time	(0008,0030)	2	Created
	Referring Physician's Name	(0008,0090)	2	From MWL or user input
	Study ID	(0020,0010)	2	Created
	Accession Number	(0008,0050)	2	From MWL or user input
	Study Description	(0008,1030)	3	From MWL (requested procedure description) or user selected
	Referenced Study Sequence	(0008,1110)	3	From MWL or zero length

Module	Attribute	Tag	Type	Notes
	>Referenced SOP Class UID	(0008,1150)	1C	
	>Referenced SOP Instance UID	(0008,1155)	1C	
Patient Study	Patient's Age	(0010,1010)	3	From MWL or user input
	Patient's Size	(0010,1020)	3	From MWL or user input
	Patient's Weight	(0010,1030)	3	From MWL or user input
General Series	Modality	(0008,0060)	1	Set to US
	Series Instance UID	(0020,000E)	1	Created
	Series Number	(0020,0011)	2	Set to 1...n
	Protocol Name	(0018,1030)	3	
	Operators' Name	(0008,1070)	3	User input
	Referenced Performed Procedure Step Sequence	(0008,1111)	3	Created (if MPPS is supported)
	>Referenced SOP Class UID	(0008,1150)	1C	1.2.840.10008.3.1.2.3.3 (MPPS SOP Class)
	>Referenced SOP Instance UID	(0008,1155)	1C	MPPS SOP Instance UID
	Request Attributes Sequence	(0040,0275)	3	From MWL or zero length
	>Requested Procedure ID	(0040,1001)	1C	
	>Requested Procedure Description	(0032,1060)	3	
	>Scheduled Procedure Step ID	(0040,0009)	1C	
	>Scheduled Protocol Code Sequence	(0040,0008)	3	
	>>Include 'Code Sequence Macro'			
	Performed Protocol Code Sequence	(0040,0260)	3	
	>Include 'Code Sequence Macro'			
General Equipment	Manufacturer	(0008,0070)	2	Set to "SIEMENS"
	Institution Name	(0008,0080)	3	From MWL or user selected
	Station Name	(0008,1010)	3	Set to the computer's host name
	Institutional Department Name	(0008,1040)	3	
	Manufacturer's Model Name	(0008,1090)	3	Set to "ACUSON SC2000"
	Device Serial Number	(0018,1000)	3	Set to system serial number
	Software Versions	(0018,1020)	3	Set to "VA16D" or "VA16E"
General Image	Instance Number	(0020,0013)	2	1...n
	Patient Orientation	(0020,0020)	2C	Set to zero length
	Content Date	(0008,0023)	2C	Created
	Content Time	(0008,0033)	2C	Created
	Acquisition Date	(0008,0022)	3	Created
	Acquisition Time	(0008,0032)	3	Created
	Source Image Sequence	(0008,2112)	3	
	>Referenced SOP Class UID	(0008,1150)	1C	
	>Referenced SOP Instance UID	(0008,1155)	1C	
	Lossy Image Compression Ratio	(0028,2112)	3	Only used with JPEG Lossy compression
	Lossy Image Compression Method	(0028,2114)	3	
Image Pixel	Rows	(0028,0010)	1	Set to 768
	Columns	(0028,0011)	1	Set to 1024
	Pixel Data	(7FE0,0010)	1	
Cine	Frame Time Vector	(0018,1065)	1C	1 to Number of Frames

Module	Attribute	Tag	Type	Notes
Multi-frame	Number of Frames	(0028,0008)	1	
US Region Calibration	Sequence of Ultrasound Regions	(0018,6011)	1	One created for each US region displayed
	>Region Location Min x0	(0018,6018)	1	
	>Region Location Min y0	(0018,601A)	1	
	>Region Location Max x1	(0018,601C)	1	
	>Region Location Max y1	(0018,601E)	1	
	>Physical Units X Direction	(0018,6024)	1	
	>Physical Units Y Direction	(0018,6026)	1	
	>Physical Delta X	(0018,602C)	1	
	>Physical Delta Y	(0018,602E)	1	
	>Reference Pixel x0	(0018,6020)	3	
	>Reference Pixel y0	(0018,6022)	3	
	>Ref. Pixel Physical Value X	(0018,6028)	3	
	>Ref. Pixel Physical Value Y	(0018,602A)	3	
	>Region Spatial Format	(0018,6012)	1	
	>Region Data Type	(0018,6014)	1	
	>Region Flags	(0018,6016)	1	
US Image	Samples Per Pixel	(0028,0002)	1	Set to 3 Set to 1 if RGB to MONOCHROME2 is Configured for remote destination
	Photometric Interpretation	(0028,0004)	1	See Table 2-8
	Bits Allocated	(0028,0100)	1	Set to 8
	Bits Stored	(0028,0101)	1	Set to 8
	High Bit	(0028,0102)	1	Set to 7
	Planar Configuration	(0028,0006)	1C	Set to 0 (color-by-pixel)
	Pixel Representation	(0028,0103)	1	Set to 0 (unsigned integer)
	Frame Increment Pointer	(0028,0009)	1C	Sequencing by Frame Time Vector (0018,1065)
	Image Type	(0008,0008)	2	Normally DERIVED\PRIMARY\INTRACARDIAC\<nnnn>
	Lossy Image Compression	(0028,2110)	1C	Set to 01
	Number of Stages	(0008,2124)	2C	
	Number of Views in Stage	(0008,212A)	2C	
	R Wave Time Vector	(0018,6060)	3	
	Stage Name	(0008,2120)	3	
	Stage Number	(0008,2122)	3	
	View Name	(0008,2127)	3	
	View Number	(0008,2128)	3	
	Heart Rate	(0018,1088)	3	
	Transducer Data	(0018,5010)	3	Probe name
	Transducer Type	(0018,6031)	3	
	Focus Depth	(0018,5012)	3	
	Mechanical Index	(0018,5022)	3	

Module	Attribute	Tag	Type	Notes
SOP Common	SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.1.3.1
	SOP Instance UID	(0008,0018)	1	Created
	Specific Character Set	(0008,0005)	1C	From MWL or set to ISO_IR 100
	Instance Creation Date	(0008,0012)	3	Created
	Instance Creation Time	(0008,0013)	3	Created
Standard Extended SOP Class - Standard and Private Attributes				
General Study	Performed Procedure Step ID	(0040,0253)	3	Created (if MPPS is supported)
	Performed Procedure Step Start Date	(0040,0244)	3	
	Performed Procedure Step Start Time	(0040,0245)	3	
	Performed Procedure Step Description	(0040,0254)	3	
Image Pixel	Pixel Spacing	(0028,0030)	1C	
Waveform	Waveform Sequence	(5400,0100)	3	
	>Acquisition DateTime	(0008,002A)	1	
	>Trigger Time Offset	(0018,1069)	1C	
	>Waveform Originality	(003A,0004)	1	ORIGINAL
	>Number of Waveform Channels	(003A,0005)	1	1
	>Number of Waveform Samples	(003A,0010)	1	
	>Sampling Frequency	(003A,001A)	1	
	>Channel Definition Sequence	(003A,0200)	1	
	>>Channel Source Sequence	(003A,0208)	1	
	>>>Include ‘Code Sequence Macro’			
	>>Channel Sensitivity	(003A,0210)	1C	
	>>Channel Sensitivity Units Sequence	(003A,0211)	1C	
	>>>Include ‘Code Sequence Macro’			
	>>Waveform Bits Stored	(003A,021A)	1	
	>Waveform Bits Allocated	(5400,1004)	1	
	>Waveform Sample Interpretation	(5400,1006)	1	
	>Waveform Data	(5400,1010)	1	
Cardiac Synchronization	Per-frame Functional Groups Sequence	(5200,9230)	3	
	>Cardiac Synchronization Sequence	(0018,9118)	1	
	>>Frame Reference DateTime	(0018,9151)	1C	
	>>Nominal Cardiac Trigger Delay Time	(0020,9153)	1	
Private	Private Creator Data Element (Implementor)	(0119,0010)	3	Set to “SIEMENS Ultrasound SC2000”
	Volume Rate	(0119,1013)	3	
Private	Private Creator Data Element (Implementor)	(0139,0010)	3	Set to “SIEMENS Ultrasound SC2000”
Private	Private Creator Data Element (Implementor)	(0009,0010)	3	Set to “ACUSON:1.2.840.113680.1.0:0910”
	Custom Field 1	(0009,1002)	3	Values entered by user on Patient Registration Field : Custom Field 1

Module	Attribute	Tag	Type	Notes
	Custom Field 2	(0009,1003)	3	Values entered by user on Patient Registration Field : Custom Field 2

6.1.1.3 Secondary Capture Image IOD Attributes

Module	Attribute	Tag	Type	Notes
Patient	Patient's Name	(0010,0010)	2	From MWL or user input
	Patient ID	(0010,0020)	2	From MWL or user input
	Patient's Birth Date	(0010,0030)	2	From MWL or user input
	Patient's Sex	(0010,0040)	2	From MWL or user input
General Study	Study Instance UID	(0020,000D)	1	From MWL or created
	Study Date	(0008,0020)	2	From MWL or created
	Study Time	(0008,0030)	2	Created
	Referring Physician's Name	(0008,0090)	2	From MWL or user input
	Study ID	(0020,0010)	2	Created
	Accession Number	(0008,0050)	2	From MWL or user input
	Study Description	(0008,1030)	3	From MWL (requested procedure description) or user selected
	Referenced Study Sequence	(0008,1110)	3	From MWL or zero length
	>Referenced SOP Class UID	(0008,1150)	1C	
	>Referenced SOP Instance UID	(0008,1155)	1C	
Patient Study	Patient's Age	(0010,1010)	3	From MWL or user input
	Patient's Size	(0010,1020)	3	From MWL or user input
	Patient's Weight	(0010,1030)	3	From MWL or user input
General Series	Modality	(0008,0060)	3	Set to US
	Series Instance UID	(0020,000E)	1	Created
	Series Number	(0020,0011)	2	Set to 1...n
	Protocol Name	(0018,1030)	3	
	Operators' Name	(0008,1070)	3	User input
	Referenced Performed Procedure Step Sequence	(0008,1111)	3	Created (if MPPS is supported)
	>Referenced SOP Class UID	(0008,1150)	1C	1.2.840.10008.3.1.2.3.3 (MPPS SOP Class)
	>Referenced SOP Instance UID	(0008,1155)	1C	MPPS SOP Instance UID
	Request Attributes Sequence	(0040,0275)	3	From MWL or zero length
	>Requested Procedure ID	(0040,1001)	1C	
	>Requested Procedure Description	(0032,1060)	3	
	>Scheduled Procedure Step ID	(0040,0009)	1C	
	>Scheduled Protocol Code Sequence	(0040,0008)	3	
	>>Include 'Code Sequence Macro'		1C	
General Equipment	Manufacturer	(0008,0070)	2	Set to "SIEMENS"
	Institution Name	(0008,0080)	3	From MWL or user selected
	Station Name	(0008,1010)	3	Set to the computer's host name

Module	Attribute	Tag	Type	Notes
	Institutional Department Name	(0008,1040)	3	
	Manufacturer's Model Name	(0008,1090)	3	Set to “ACUSON SC2000”
	Device Serial Number	(0018,1000)	3	Set to system serial number
	Software Versions	(0018,1020)	3	Set to “VA16D” or “VA16E”
SC Equipment	Conversion Type	(0008,0064)	1	Set to WSD
General Image	Instance Number	(0020,0013)	2	1...n
	Patient Orientation	(0020,0020)	2C	Set to zero length
	Content Date	(0008,0023)	2C	Created
	Content Time	(0008,0033)	2C	Created
	Acquisition Date	(0008,0022)	3	Created
	Acquisition Time	(0008,0032)	3	Created
	Derivation Description	(0008,2111)	3	
Image Pixel	Samples Per Pixel	(0028,0002)	1	Set to 3
	Photometric Interpretation	(0028,0004)	1	See Table 2-8
	Rows	(0028,0010)	1	Set to 1050
	Columns	(0028,0011)	1	Set to 1680
	Bits Allocated	(0028,0100)	1	Set to 8
	Bits Stored	(0028,0101)	1	Set to 8
	High Bit	(0028,0102)	1	Set to 7
	Pixel Representation	(0028,0103)	1	Set to 0 (unsigned integer)
	Pixel Data	(7FE0,0010)	1C	
	Planar Configuration	(0028,0006)	1C	Set to 0 (color-by-pixel)
SOP Common	SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.1.7
	SOP Instance UID	(0008,0018)	1	Created
	Specific Character Set	(0008,0005)	1C	From MWL or set to ISO_IR 100
	Instance Creation Date	(0008,0012)	3	Created
	Instance Creation Time	(0008,0013)	3	Created
Standard Extended SOP Class - Standard and Private Attributes				
General Study	Performed Procedure Step ID	(0040,0253)	3	Created (if MPPS is supported)
	Performed Procedure Step Start Date	(0040,0244)	3	
	Performed Procedure Step Start Time	(0040,0245)	3	
	Performed Procedure Step Description	(0040,0254)	3	
Private	Private Creator Data Element (Implementor)	(0009,0010)	3	Set to “ACUSON:1.2.840.113680.1.0:0910”
	Custom Field 1	(0009,1002)	3	Values entered by user on Patient Registration Field : Custom Field 1
	Custom Field 2	(0009,1003)	3	Values entered by user on Patient Registration Field : Custom Field 2

6.1.1.4 Comprehensive SR IOD Attributes

Module Name	Attribute	Tag	Type	Notes
Patient	Patient's Name	(0010,0010)	2	From MWL or user input
	Patient ID	(0010,0020)	2	From MWL or user input
	Patient's Birth Date	(0010,0030)	2	From MWL or user input
	Patient's Sex	(0010,0040)	2	From MWL or user input
	Patient Comments	(0010,4000)	3	
General Study	Study Instance UID	(0020,000D)	1	From MWL or created
	Study Date	(0008,0020)	2	From MWL or created
	Study Time	(0008,0030)	2	Created
	Referring Physician's Name	(0008,0090)	2	From MWL or user input
	Study ID	(0020,0010)	2	Created
	Accession Number	(0008,0050)	2	From MWL or user input
	Study Description	(0008,1030)	3	From MWL (requested procedure description) or user selected
	Referenced Study Sequence	(0008,1110)	3	From MWL or zero length
	>Referenced SOP Class UID	(0008,1150)	1C	
	>Referenced SOP Instance UID	(0008,1155)	1C	
Patient Study	Patient's Age	(0010,1010)	3	From MWL or user input
	Patient's Size	(0010,1020)	3	From MWL or user input
	Patient's Weight	(0010,1030)	3	From MWL or user input
General Equipment	Manufacturer	(0008,0070)	2	Set to "SIEMENS"
	Institution Name	(0008,0080)	3	From MWL or user selected
	Station Name	(0008,1010)	3	Set to the computer's host name
	Institutional Department Name	(0008,1040)	3	
	Manufacturer's Model Name	(0008,1090)	3	Set to "ACUSON SC2000"
	Device Serial Number	(0018,1000)	3	Set to system serial number
	Software Versions	(0018,1020)	3	Set to "VA16D" or "VA16E"
SR Document Series	Modality	(0008,0060)	1	Defined term "SR" used
	Series Instance UID	(0020,000E)	1	Uniquely generated by the SC2000
	Series Number	(0020,0011)	1	Internally generated; incremented for each new exam within a study
	Reference Performed Procedure Step Sequence	(0008,1111)	2	
	>Referenced SOP Class UID	(0008,1150)	1C	
	>Reference SOP Instance UID	(0008,1155)	1C	
SR Document General	Instance Number	(0020,0013)	1	Internally generated; incremented for each new SR document within a study
	Completion Flag	(0040,A491)	1	Defined Term "PARTIAL" used
	Verification Flag	(0040,A493)	1	Defined Term "UNVERIFIED" used
	Content Date	(0008,0023)	1	Created
	Content Time	(0008,0033)	1	Created
	Referenced Request Sequence	(0040,A370)	1C	From MWL if available
	>Study Instance UID	(0020,000D)	1	Taken from the Study Instance UID in the General Study Module
	>Referenced Study Sequence	(0008,1110)	2	

Module Name	Attribute	Tag	Type	Notes
	>>Referenced SOP Class UID	(0008,1150)	1C	
	>>Reference SOP Instance UID	(0008,1155)	1C	
	>Accession Number	(0008,0050)	2	From MWL or user input
	>Placer Order Number/Imaging Service Request	(0040,2016)	2	From MWL if available
	>Filler Order Number/Imaging Service Request	(0040,2017)	2	From MWL if available
	>Requested Procedure ID	(0040,1001)	2	From MWL if available
	>Requested Procedure Description	(0032,1060)	2	From MWL if available
	>Requested Procedure Code Sequence	(0032,1064)	2	From MWL if available
	>>Include 'Code Sequence Macro'			
	Performed Procedure Code Sequence	(0040,A372)	2	
	>Include 'Code Sequence Macro'			
SR Document Content	Value Type	(0040,A040)	1	CONTAINER
	Concept Name Code Sequence	(0040,A043)	1C	
	>Code Value	(0008,0100)	1	Set to "125200"
	>Coding Scheme Designator	(0008,0102)	1	Set to "DCM"
	>Code Meaning	(0008,0104)	1	Set to "Adult Echocardiography Procedure Report"
	Continuity of Content	(0040,A050)	1	SEPARATE
	Content Template Sequence	(0040,A504)	1C	
	>Mapping Resource	(0008,0105)	1	Set to "DCMR"
	>Template Identifier	(0040,DB00)	1	Set to "5200" for Adult Echocardiography Procedure Report
	Content Sequence	(0040,A730)	1C	See Appendix for content of "Adult Echocardiography Procedure Report"
SOP Common	SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.1.88.33
	SOP Instance UID	(0008,0018)	1	Created
	Specific Character Set	(0008,0005)	1C	From MWL or set to ISO_IR 100

Module Name	Attribute	Tag	Type	Notes
Standard Extended SOP Class - Standard and Private Attributes				
SR Document Series	Operators' Name	(0008,1070)	3	User input
	Performed Procedure Step ID	(0040,0253)	3	
	Performed Procedure Step Start Date	(0040,0244)	3	
	Performed Procedure Step Start Time	(0040,0245)	3	
	Performed Procedure Step Description	(0040,0254)	3	
SR Document General	Requesting Physician	(0032,1032)	3	From MWL if available
	Requested Procedure ID	(0040,1001)	2	From MWL if available
	Requested Procedure Description	(0032,1060)	2	From MWL if available
	Referenced Request Sequence >Requesting Physician >Performed Procedure Code Sequence >>Include 'Code Sequence Macro'	 (0032,1032) (0040,A372)	 3 2	From MWL if available
Private	Private Creator Data Element (Implementor)	(0009,0010)	3	Set to "ACUSON:1.2.840.113680.1.0:0910"
	Custom Field 1	(0009,1002)	3	Values entered by user on Patient Registration Field : Custom Field 1
	Custom Field 2	(0009,1003)	3	Values entered by user on Patient Registration Field : Custom Field 2
	Indications	(0009, 1004)	3	Values entered by user on patient registration field: Indications
Private	Private Creator Data Element (Implementor)	(0021,0010)	3	Set to "syngoDynamics_Reporting"
	Private Creator Data Element	(0021,10AD)	3	Byte stream
Private	Private Creator Data Element (Implementor)	(0029,0010)	3	Set to "SIEMENS CSA REPORT"
	syngo Report Type	(0029,1008)	3	Set to "US_ADULT_ECHO"
	syngo Report Version	(0029,1009)	3	Set to "1.3"
Private	Private Creator Data Element (Implementor)	(0077,0010)	3	Set to "SIEMENS SYNGO EVIDENCE DOCUMENT DATA"
	Evidence Document Template Name	(0077,1010)	3	Set to "SiemensUS_AdultEchoReport"
	Evidence Document Template Version	(0077,1011)	3	Set to "1.3"
	Private Creator Data Element	(0077,1020)	3	Byte stream
	Private Creator Data Element	(0077,1021)	3	Byte stream
	Framework Version	(0077,1030)	3	Set to "0.1"
	Private Creator Data Element	(0077,1040)	3	Byte stream

6.1.1.5 Raw Data IOD Attributes

Module	Attribute	Tag	Type	Notes
Patient	Patient's Name	(0010,0010)	2	From MWL or user input
	Patient ID	(0010,0020)	2	From MWL or user input

Module	Attribute	Tag	Type	Notes
	Patient's Birth Date	(0010,0030)	2	From MWL or user input
	Patient's Sex	(0010,0040)	2	From MWL or user input
General Study	Study Instance UID	(0020,000D)	1	From MWL or created
	Study Date	(0008,0020)	2	From MWL or created
	Study Time	(0008,0030)	2	Created
	Referring Physician's Name	(0008,0090)	2	From MWL or user input
	Study ID	(0020,0010)	2	Created
	Accession Number	(0008,0050)	2	From MWL or user input
	Study Description	(0008,1030)	3	From MWL (requested procedure description) or user selected
	Referenced Study Sequence	(0008,1110)	3	From MWL or zero length
	>Referenced SOP Class UID	(0008,1150)	1C	
	>Referenced SOP Instance UID	(0008,1155)	1C	
Patient Study	Patient's Age	(0010,1010)	3	From MWL or user input
	Patient's Size	(0010,1020)	3	From MWL or user input
	Patient's Weight	(0010,1030)	3	From MWL or user input
General Series	Modality	(0008,0060)	1	Set to US
	Series Instance UID	(0020,000E)	1	Created
	Series Number	(0020,0011)	2	Set to 1...n
	Protocol Name	(0018,1030)	3	
	Operators' Name	(0008,1070)	3	User input
	Referenced Performed Procedure Step Sequence	(0008,1111)	3	Created (if MPPS is supported)
	>Referenced SOP Class UID	(0008,1150)	1C	1.2.840.10008.3.1.2.3.3 (MPPS SOP Class)
	>Referenced SOP Instance UID	(0008,1155)	1C	MPPS SOP Instance UID
	Request Attributes Sequence	(0040,0275)	3	From MWL or zero length
	>Requested Procedure ID	(0040,1001)	1C	
	>Requested Procedure Description	(0032,1060)	3	
	>Scheduled Procedure Step ID	(0040,0009)	1C	
	>Scheduled Protocol Code Sequence	(0040,0008)	3	
	>>Include ‘Code Sequence Macro’			
General Equipment	Manufacturer	(0008,0070)	2	Set to “SIEMENS”
	Institution Name	(0008,0080)	3	From MWL or user selected
	Station Name	(0008,1010)	3	Set to the computer’s host name
	Institutional Department Name	(0008,1040)	3	
	Manufacturer's Model Name	(0008,1090)	3	Set to “ACUSON SC2000”
	Device Serial Number	(0018,1000)	3	Set to system serial number
	Software Versions	(0018,1020)	3	Set to “VA16D” or “VA16E”
Acquisition Context	Acquisition Context Sequence	(0040,0555)	2	Zero length
Raw Data	Instance Number	(0020,0013)	2	A number that identifies the image, system generated, should be sequential in acquisition order

Module	Attribute	Tag	Type	Notes
Raw Data	Content Date	(0008, 0023)	1	Date when creation of this object started
	Content Time	(0008, 0033)	1	Time when creation of this object started
	Acquisition DateTime	(0008,002A)	3	Date and time when acquisition started.
	Creator-Version UID	(0008,9123)	1	Unique identification for the equipment and version of the software that has created this object
	Source Image Sequence	(0008,2112)	1C	Image object that was used to derive this object. Required if Acoustic Data Sequence (0019,1002) is not present. This mechanism will be used to store updated bookmarks without including the complete pixel data.
	>Referenced SOP Class UID	(0008,1050)	1	SOP Class UID for Raw Data IOD
	>Referenced SOP Instance UID	(0008,1155)	1	SOP Instance UI of the Raw Data object that was used to derive this object
	Referenced Image Sequence	(0008,1140)	3	Reference to the 2D Image representing this view
	>Referenced SOP Class UID	(0008,1050)	1	SOP Class UID for the DICOM Ultrasound Image Storage SOP Class or the DICOM Ultrasound Multi-Frame Image Storage SOP Class
	>Referenced SOP Instance UID	(0008,1155)	1	SOP Instance UI of the referenced image
	Private Creator Data Element (Implementor)	(0119,0010)	1	SIEMENS Ultrasound SC2000
	Common Acoustic Meta Information	(0119,1001)	1C	Control information describing the acoustic data, which is common to all frames. Required if Source Image Sequence is not present
	Multi Stream Sequence	(0119,1002)	1C	Sequence of acoustic data blocks for multiple streams. One sequence per stream. Required if source image sequence is not present.
	>Acoustic Data Sequence	(0119,1003)	1C	Sequence for chunks of acoustic data for specific control information and acoustic data chunks. One item per chunk. One sequence per transaction.
	>>Per Transaction Acoustic Control Information	(0119,1004)	1	Transaction data, one for each transaction
	>>Acoustic Data Offset	(0119,1005)	1	Offset of current Volume in Acoustic Image and Footer Data. One per transaction per stream

Module	Attribute	Tag	Type	Notes
Raw Data	>>Acoustic Data Length	(0119,1006)	1	Length of current Volume in Acoustic Image and Footer Data One per transaction per stream
	>>Footer Offset	(0119,1007)	1	Offset of footer for current Volume in Acoustic Image and Footer Data One per transaction per stream
	>>Footer Length	(0119,1008)	1	Length of footer for current Volume in Acoustic Image and Footer Data One per transaction per stream
	>Acoustic Stream Number	(0119, 1009)	1C	Identification of acoustic stream number. One per stream
	>Acoustic Stream Type	(0119.1010)	1C	Identification of acoustic stream type. One per stream
	Private Creator Data Element (Implementor)	(0129,0010)	1	SIEMENS Ultrasound SC2000
	Raw Data Object Type	(0129,1030)	1	Defined Term for Object Type • VOLUME • APPLICATION STATE • EXAM STATE
	>Cine Parameters Schema	(0129,1021)	3	Schema describing stored Cine Parameters Data.
	>Cine Parameters Data	(0129,1022)	3	Values of Cine Parameters
	Visualization Sequence	(0129,1006)	3	Sequence for Volume Rendered views. One item for each view.
	>Visualization Information	(0129,1008)	1C	Volume rendering parameters. Required if Sequence is present.
	Application State Sequence	(0129,1009)	1	Sequence of application states. One item for each application that was started online
	>Application State Information	(0129,1010)	1C	Application state information.
	Cine Parameters Sequence	(0129,1020)	3	Cine Parameters
	Private Creator Data Element (Implementor)	(7FD1,0010)	3	SIEMENS Ultrasound SC2000
	Acoustic Image and Footer Data	(7FD1,1001)	3	Acoustic image data frame
	Volume Version ID	(7FD1,1009)	3	1.2
	Volume Payload	(7FD1,1010)	3	
	After Payload	(7FD1,1011)	3	
General Image	Acquisition Date	(0008,0022)	3	The date of the acquisition of this image
	Acquisition Time	(0008,0032)	3	The time of the acquisition of this image
US Image	Number of Stages	(0008,2124)	2C	
	Number of Views in Stage	(0008,212A)	2C	

Module	Attribute	Tag	Type	Notes
	R Wave Time Vector	(0018,6060)	3	Vector of time offsets of the r-waves peaks relative to the start of Acquisition Datetime of the image data.
	Stage Name	(0008,2120)	3	
	Stage Number	(0008,2122)	3	
	Heart Rate	(0018,1088)	3	Beats per minute
	Mechanical Index	(0018,5022)	3	The mechanical index, when made available by a manufacturer, are defined according to the *Standard for Real-Time Display of Thermal and Mechanical Acoustic Output Indices on Diagnostic Ultrasound Equipment*
Waveform	Waveform Sequence	(5400,0100)	3	
	>Acquisition DateTime	(0008,002A)	1	
	>Trigger Time Offset	(0018,1069)	1C	
	>Waveform Originality	(003A,0004)	1	ORIGINAL
	>Number of Waveform Channels	(003A,0005)	1	1
	>Number of Waveform Samples	(003A,0010)	1	
	>Sampling Frequency	(003A,001A)	1	
	>Channel Definition Sequence	(003A,0200)	1	
	>>Channel Source Sequence	(003A,0208)	1	
	>>>Include 'Code Sequence Macro'			
	>>Channel Sensitivity	(003A,0210)	1C	
	>>Channel Sensitivity Units Sequence	(003A,0211)	1C	
	>>>Include 'Code Sequence Macro'			
	>>Waveform Bits Stored	(003A,021A)	1	
	>Waveform Bits Allocated	(5400,1004)	1	
	>Waveform Sample Interpretation	(5400,1006)	1	
	>Waveform Data	(5400,1010)	1	
SOP Common	SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.1.66
	SOP Instance UID	(0008,0018)	1	Created
	Specific Character Set	(0008,0005)	1C	From MWL or set to ISO_IR 100
	Instance Creation Date	(0008,0012)	3	Created
	Instance Creation Time	(0008,0013)	3	Created
Standard Extended SOP Class - Standard and Private Attributes				
General Study	Performed Procedure Step ID	(0040,0253)	3	Created (if MPPS is supported)
	Performed Procedure Step Start Date	(0040,0244)	3	
	Performed Procedure Step Start Time	(0040,0245)	3	
	Performed Procedure Step Description	(0040,0254)	3	
General Image	Patient Orientation	(0020,0020)	2C	Set to zero length
	Image Type	(0008,0008)	3	
US Image	Stop Watch Time	(0119,1012)	3	
	Volume Rate	(0119,1013)	3	Volumes per second

6.1.1.6 MPPS: N-CREATE

The SC2000 DICOM Performed Procedure Step SCU informs the remote SCP when the examination of a scheduled procedure step will be performed. The N-CREATE message is sent when the examination is started. The following table describes the supported attributes for a N-CREATE message.

Attribute Name	Tag	Required Type	Value
SOP Common			
Specific Character Set	(0008,0005)	1C	From MWL or created
Performed Procedure Step Relationship			
Scheduled Step Attribute Sequence	(0040,0270)	1	
>Study Instance UID	(0020,000D)	1	From MWL or created
>Referenced Study Sequence	(0008,1110)	2	From MWL or zero length
>>Referenced SOP Class UID	(0008,1150)	1C	
>>Referenced SOP Instance UID	(0008,1155)	1C	
>Accession Number	(0008,0050)	2	From MWL or user input
>Requested Procedure ID	(0040,1001)	2	From MWL or user input
>Requested Procedure Description	(0032,1060)	2	From MWL or zero length
>Scheduled Procedure Step ID	(0040,0009)	2	From MWL or zero length
>Scheduled Procedure Step Description	(0040,0007)	2	From MWL or zero length
>Scheduled Protocol Code Sequence	(0040,0008)	2	From MWL or zero length
>>Code Value	(0008,0100)	1C	
>>Coding Scheme Designator	(0008,0102)	1C	
>>Code Scheme Version	(0008,0103)	3	
>>Code Meaning	(0008,0104)	3	
Patient's Name	(0010,0010)	2	From MWL or user input
Patient ID	(0010,0020)	2	From MWL or user input or created
Patients Birth Date	(0010,0030)	2	From MWL or user input
Patient's Sex	(0010,0040)	2	From MWL or user input
Referenced Patient Sequence	(0008,1120)	2	From MWL or zero length
>Referenced SOP Class UID	(0008,1150)	1C	
>Referenced SOP Instance UID	(0008,1155)	1C	
Performed Procedure Step Information			
Performed Procedure Step ID	(0040,0253)	1	From SPS ID or created
Performed Station AE Title	(0040,0241)	1	Own AE Title
Performed Station Name	(0040,0242)	2	Own hostname
Performed Location	(0040,0243)	2	From SPS Location or zero length
Performed Procedure Step Start Date	(0040,0244)	1	Created
Performed Procedure Step Start Time	(0040,0245)	1	Created
Performed Procedure Step Status	(0040,0252)	1	IN PROGRESS
Performed Procedure Step Description	(0040,0254)	2	From SPS Description or zero length
Performed Procedure Type Description	(0040,0255)	2	Zero length
Procedure Code Sequence	(0008,1032)	2	From Requested Procedure Code or zero length
>Code Value	(0008,0100)	1C	
>Code Scheme Designator	(0008,0102)	1C	
>Code Scheme Version	(0008,0103)	3	

Attribute Name	Tag	Required Type	Value
>Code Meaning	(0008,0104)	3	
Performed Procedure Step End Date	(0040,0250)	2	Zero length
Performed Procedure Step End Time	(0040,0251)	2	Zero length
Image Acquisition Results			
Modality	(0008,0060)	1	US
Study ID	(0020,0010)	2	From Requested Procedure ID or created
Performed Protocol Code Sequence	(0040,0260)	2	From Scheduled Action Item Code SQ or zero length
>Code Value	(0008,0100)	1C	
>Code Scheme Designator	(0008,0102)	1C	
>Code Scheme Version	(0008,0103)	3	
>Code Meaning	(0008,0104)	3	
Performed Series Sequence	(0040,0340)	2	
>Performing Physician's Name	(0008,1050)	2C	From MWL or user input
>Protocol Name	(0018,1030)	1C	Set to "unknown"
>Operator's Name	(0008,1070)	2C	User input
>Series Instance UID	(0020,000E)	1C	Created
>Retrieve AE Title	(0008,0054)	2C	Zero length
>Referenced Image Sequence	(0008,1140)	2C	Zero length
>>Referenced SOP Class UID	(0008,1150)	1C	
>>Referenced SOP Instance UID	(0008,1155)	1C	
>Referenced Non-Image Composite SOP Instance Sequence	(0040,0220)	2C	
>>Referenced SOP Class UID	(0008,1150)	1C	
>>Referenced SOP Instance UID	(0008,1155)	1C	
>Referenced Standalone SOP Instance Sequence	(0040,0220)	2C	Zero length

6.1.1.7 MPPS: N-SET

The SC2000 DICOM Performed Procedure Step SCU informs the remote SCP about the performed examination and its status. The N-SET message is only sent once when the exam is ended with status "COMPLETED" or when the examination could not be completed with status "DISCONTINUED". The following table describes the supported attributes for a N-SET message.

Attribute name	Tag	Required Type	Value
Performed Procedure Step Information			
Performed Procedure Step Status	(0040,0252)	3	COMPLETED or DISCONTINUED
Performed Procedure Step Description	(0040,0254)	3	From SPS Description or user input
Performed Procedure Type Description	(0040,0255)	3	User input
Procedure Code Sequence	(0008,1032)	3	From Requested Procedure Code
>Code Value	(0008,0100)	1C	
>Code Scheme Designator	(0008,0102)	1C	
>Code Scheme Version	(0008,0103)	3	
>Code Meaning	(0008,0104)	3	

Attribute name	Tag	Required Type	Value
Performed Procedure Step End Date	(0040,0250)	3	Created
Performed Procedure Step End Time	(0040,0251)	3	Created
Image Acquisition Results			
Performed Action Item Code Sequence	(0040,0260)	3	From Scheduled Action Item Code SQ.
>Code Value	(0008,0100)	1C	
>Code Scheme Designator	(0008,0102)	1C	
>Code Scheme Version	(0008,0103)	3	
>Code Meaning	(0008,0104)	3	
Performed Series Sequence	(0040,0340)	3	
>Performing Physician's Name	(0008,1050)	2C	From MWL or user input
>Protocol Name	(0018,1030)	1C	User input or set to "unknown"
>Operator's Name	(0008,1070)	2C	User input
>Series Instance UID	(0020,000E)	1C	Created
>Retrieve AE Title	(0008,0054)	2C	From Storage Commitment RSP or zero length
>Referenced Image Sequence	(0008,1140)	2C	Created
>>Referenced SOP Class UID	(0008,1150)	1C	
>>Referenced SOP Instance UID	(0008,1155)	1C	
>Referenced Standalone SOP Instance Sequence	(0040,0220)	2C	Zero length

6.1.1.8 Query: C-FIND

The SC2000 DICOM Query/Retrieve SCU supports hierarchical queries with all mandatory search keys. The interactive querying of attributes on IMAGE level is not supported by the Query SCU. Though, retrieval of individual Objects is possible. The following table describes the search keys for the different query models that the SCU supports. Matching is either wildcard, which means that the user can supply a string containing wildcards, or universal, which means that the attribute is requested as return value.

Attribute Name	Tag	Type	Matching	User Input	Return Value Display
Patient Level					
Patient Name	(0010,0010)	R	Wildcard	Enter value	Yes
Patient ID	(0010,0020)	U	Wildcard	Enter value	Yes
Patient's Birth date	(0010,0030)	O	Universal (Null)	Enter value	Yes
Patient's Sex	(0010,0040)	O	Universal (Null)	Enter value	Yes
Study Level					
Patient Name	(0010,0010)	R	Wildcard	Enter value	Yes
Patient ID	(0010,0020)	R	Wildcard	Enter value	Yes
Patient's Birth date	(0010,0030)	O	Universal (Null)	Enter value	Yes
Patient's Sex	(0010,0040)	O	Universal (Null)	Enter value	Yes
Study Instance UID	(0020,000D)	U	Universal (Null)		No
Study ID	(0020,0010)	R	Universal (Null)	Enter value	Yes
Study Date	(0008,0020)	R	Universal (Null)	Enter value	Yes
Study Time	(0008,0030)	R	Universal (Null)	-	Yes
Accession Number	(0008,0050)	R	Universal (Null)	Enter value	Yes

Attribute Name	Tag	Type	Matching	User Input	Return Value Display
Study Description	(0008,1030)	O	Universal (Null)	Enter value	Yes
Referring Physician's Name	(0008,0090)	O	Universal (Null)	Enter value	Yes
Name of Physician Reading Study	(0008,1060)	O	Universal (Null)	Enter value	Yes
Modalities in Study	(0008,0061)	O	Universal (Null)	Enter value	Yes
Retrieve AE Title	(0008,0054)	O	Universal (Null)		No
Number of Study related Series	(0020,1206)	O	Universal (Null)		Yes
Number of Study related Instances	(0020,1208)	O	Universal (Null)		No
Series Level					
Series Instance UID	(0020,000E)	U	Universal (Null)		No
Series Number	(0020,0011)	R	Universal (Null)		Yes
Modality	(0008,0060)	R	Universal (Null)	Enter value	Yes
Performing Physician	(0008,1050)	O	Universal (Null)	Enter value	Yes
Retrieve AE Title	(0008,0054)	O	Universal (Null)		Yes
Protocol Name	(0018,1030)	O	Universal (Null)		No
Performed Procedure Step Start Date	(0040,0244)	O	Universal (Null)		Yes
Performed Procedure Step Start Time	(0040,0245)	O	Universal (Null)		Yes
Requested Attribute Sequence	(0040,0275)	O	Universal (Null)		Yes
> Requested Procedure ID	(0040,1001)	O	Universal (Null)		Yes
> Scheduled Procedure ID	(0040,0009)	O	Universal (Null)		Yes
Number of Series related Instances	(0020,1209)	O	Universal (Null)		Yes
Image Level					
SOP Instance UID	(0008,0018)	U	Single value		No
Image Number	(0020,0013)	R	Universal (Null)		Yes
Retrieve AE Title	(0008,0054)	O	Universal (Null)		No
Instance Date	(0008,0023)	O	Universal (Null)		No
Instance Time	(0008,0033)	O	Universal (Null)		No
Number of Frames	(0028,0008)	O	Universal (Null)		Yes
Content Date	(0008,0023)	O	Single value, Range matching, Universal	Enter value	Yes
Content Time	(0008,0033)	O	Single value, Range matching, Universal	Enter value	Yes
Referenced Request Sequence	(0040,A370)	O	Sequence matching		Yes
>Accession Number	0008,0050)	O	Single value, Universal		Yes
>Requested Procedure ID	(0040,1000)	O	Single value, Universal		Yes

7 APPENDICES

7.1 Appendix A: Echocardiography Structured Report

This appendix lists the DICOM Structured Report (SR) mappings used in the Cardiac Structured Reports of the ACUSON SC2000 system SR files.

The mappings follow the DICOM SR Template TID 5200: Echocardiography Procedure Report, as described in PS 3.16-2008 of the DICOM Standard, and are organized in a manner similar to TID 5200. The **Label** column identifies the on-screen worksheet label associated with a measurement using the format "[Worksheet] Table Heading: Measurement Label" or "[Worksheet] Measurement Label". All private code values use the Coding Scheme Designator "99SIEMENS".

[…] contains additional information about the measurement.

The **HR** column indicates if a measurement has an individual heart rate associated it. The heart rate is defined in the SR by
HAS PROPERTIES, NUM, Heart Rate (LN, 8867-4) with VM of 1.

When a Simpson's Disk Number is associated with a volume as a modifier, it is defined in the SR by
HAS CONCEPT MOD, TEXT, Simpson Disk Number (99SIEMENS, SimpsonDiskNum) with VM of 1.

Worksheets are identified in the Label column by the following notation:

Notation	Worksheet	Notation	Worksheet
[A]	Arteries	[PV]	Pulmonary Valve
[Ao]	Ao/Aortic Valve	[PVn]	Pulmonary Veins
[D]	Diastology	[RA]	Right Atrium
[LA]	Left Atrium	[RV]	Right Ventricle
[LR]	LVA/RVA	[SE]	Stress Echo-LVA
[LV]	Left Ventricle	[Sh]	Shunts
[M]	M-mode	[TV]	Tricuspid Valve
[MV]	Mitral Valve	[V]	Volumes
[P]	PISA		

7.1.1 Patient Characteristics

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Patient Characteristics		Container: Patient Characteristics (DCM, 121118)	
	Age	Subject Age (DCM, 121033)	
	BP	Systolic Blood Pressure (SRT, F-008EC)	
		Diastolic Blood Pressure (SRT, F-008ED)	
	BSA	Body Surface Area (LN, 8277-6)	Body Surface Area Formula (LN, 8278-4) [Always set to: BSA(DuBois) = 0.007184*WT^0.425*HT^0.725 (DCM, 122241)]
	Sex	Subject Sex (DCM, 121032)	

7.1.2 Left Ventricle

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Left Ventricle		Container: Findings (DCM, 121070)	Finding Site: Left Ventricle (SRT, T-32600)
Measurements of Image Mode: 2D mode (SRT, G-03A2)			
	[Ao] Aortic Valve: LVOT Area	Cardiovascular Orifice Area (SRT, G-038E)	Finding Site: Left Ventricle Outflow Tract (SRT, T-32650)
X	[Ao] Aortic Valve: LVOT Diam s	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Left Ventricle Outflow Tract (SRT, T-32650) Cardiac Cycle Point: Systole (SRT, F-32020)
	[Ao] Aortic Valve: LVOT SV	Stroke Volume (SRT, F-32120)	Finding Site: Left Ventricle Outflow Tract (SRT, T-32650)
	[LV] IVS % Thck	Interventricular Septum % Thickening (LN, 18054-7)	Image View: Parasternal long axis (SRT, G-0396)
	[LV] IVS/LVPW	Interventricular Septum to Posterior Wall Thickness Ratio (LN, 18155-2)	
	[LV] LV Major, max	Left Ventricle systolic major axis (LN, 18076-0)	Derivation: Maximum (SRT, G-A437)
	[LV] LV % FS	Left Ventricular Fractional Shortening (LN, 18051-3)	Image View: Parasternal long axis (SRT, G-0396)
	[LV] LVPW % Thck	Left Ventricle Posterior Wall % Thickening (LN, 18053-9)	Image View: Parasternal long axis (SRT, G-0396)
	[LV] AL: LV Mass	Left Ventricle Mass (LN, 18087-7)	Measurement Method: Area-Length Single Plane (DCM, 125205)
	[LV] AL: LV Mass/BSA	Mass/BSA (99SIEMENS, MassBSAIndex)	Measurement Method: Area-Length Single Plane (DCM, 125205) Index: Body Surface Area (LN, 8277-6)
	[LV] AL: LV Mass/Ht	Mass/Height (99SIEMENS, MassHtIndex)	Measurement Method: Area-Length Single Plane (DCM, 125205) Index: Patient Height (LN, 8302-2)
	[LV] Cubed: LV CI	Cardiac Index (SRT, F-32110)	Measurement Method: Cube Method (DCM, 125206)
	[LV] Cubed: LV CO	Cardiac Output (SRT, F-32100)	Measurement Method: Cube Method (DCM, 125206)
	[LV] Cubed: LV EF	Left Ventricular Ejection Fraction (LN, 18043-0)	Measurement Method: Cube Method (DCM, 125206)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[LV] Cubed: LV HR	Composite heart rate for LV CO, Cubed (99SIEMENS, LVHRCOCube2D)	
	[LV] Cubed: LV SI	Stroke Index (SRT, F-00078)	Measurement Method: Cube Method (DCM, 125206)
	[LV] Cubed: LV SV	Stroke Volume (SRT, F-32120)	Measurement Method: Cube Method (DCM, 125206)
	[LV] Cubed: LV Vol d	Left Ventricular End Diastolic Volume (LN, 18026-5)	Measurement Method: Cube Method (DCM, 125206)
	[LV] Cubed: LV Vol s	Left Ventricular End Systolic Volume (LN, 18148-7)	Measurement Method: Cube Method (DCM, 125206)
	[LV] Cubed: LV % FS	Left Ventricular Fractional Shortening (LN, 18051-3)	Measurement Method: Cube Method (DCM, 125206)
	[LV] Diastole: IVS	Interventricular Septum Diastolic Thickness (LN, 18154-5)	Image View: Parasternal long axis (SRT, G-0396)
X	[LV] Diastole: LVID	Left Ventricle Internal End Diastolic Dimension (LN, 29436-3)	Image View: Parasternal long axis (SRT, G-0396)
	[LV] Diastole: LVPW	Left Ventricle Posterior Wall Diastolic Thickness (LN, 18152-9)	Image View: Parasternal long axis (SRT, G-0396)
	[LV] PSAX, Cubed: LV EF	Left Ventricular Ejection Fraction (LN, 18043-0)	Measurement Method: Cube Method (DCM, 125206) Image View: Parasternal short axis (SRT, G-0397)
	[LV] PSAX, Diastole: IVS	Interventricular Septum Diastolic Thickness (LN, 18154-5)	Image View: Parasternal short axis (SRT, G-0397)
X	[LV] PSAX, Diastole: LV Area pap	Left Ventricular Diastolic Area (SRT, G-0375)	Image View: Parasternal short axis at the Papillary Muscle level (SRT, G-039B)
	[LV] PSAX, Diastole: LV Epi Area pap	Left Ventricle Epicardial Diastolic Area, psax pap view (SRT, G-0379)	
	[LV] PSAX, Diastole: LV Mean Wall Thickness	Left Ventricle Posterior Wall Diastolic Thickness (LN, 18152-9)	Derivation: Mean (SRT, R-00317)
	[LV] PSAX, Diastole: LV Minor Rad pap	Minor Radius (99SIEMENS, MinorRadius)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Parasternal short axis at the Papillary Muscle level (SRT, G-039B)
X	[LV] PSAX, Diastole: LVID chord	Left Ventricle Internal End Diastolic Dimension (LN, 29436-3)	Image View: Parasternal short axis at the level of the mitral chords (SRT, G-0399)
X	[LV] PSAX, Diastole: LVID pap	Left Ventricle Internal End Diastolic Dimension (LN, 29436-3)	Image View: Parasternal short axis at the Papillary Muscle level (SRT, G-039B)
	[LV] PSAX, Diastole: LVPW chord	Left Ventricle Posterior Wall Diastolic Thickness (LN, 18152-9)	Image View: Parasternal short axis at the level of the mitral chords (SRT, G-0399)
	[LV] PSAX, Diastole: LVPW pap	Left Ventricle Posterior Wall Diastolic Thickness (LN, 18152-9)	Image View: Parasternal short axis at the Papillary Muscle level (SRT, G-039B)
	[LV] PSAX, Systole: IVS	Interventricular Septum Systolic Thickness (LN, 18158-6)	Image View: Parasternal short axis (SRT, G-0397)
X	[LV] PSAX, Systole: LV Area pap	Left Ventricular Systolic Area (SRT, G-0374)	Image View: Parasternal short axis at the Papillary Muscle level (SRT, G-039B)
X	[LV] PSAX, Systole :LVID chord	Left Ventricle Internal Systolic Dimension (LN, 29438-9)	Image View: Parasternal short axis at the level of the mitral chords (SRT, G-0399)
X	[LV] PSAX, Systole: LVID pap	Left Ventricle Internal Systolic Dimension (LN, 29438-9)	Image View: Parasternal short axis at the Papillary Muscle level (SRT, G-039B)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[LV] PSAX, Systole: LVPW chord	Left Ventricle Posterior Wall Systolic Thickness (LN, 18156-0)	Image View: Parasternal short axis at the level of the mitral chords (SRT, G-0399)
	[LV] PSAX, Systole: LVPW pap	Left Ventricle Posterior Wall Systolic Thickness (LN, 18156-0)	Image View: Parasternal short axis at the Papillary Muscle level (SRT, G-039B)
	[LV] PSAX, Teichholz: LV EF	Left Ventricular Ejection Fraction (LN, 18043-0)	Measurement Method: Teichholz (DCM, 125209) Image View: Parasternal short axis (SRT, G-0397)
	[LV] Systole: IVS	Interventricular Septum Systolic Thickness (LN, 18158-6)	Image View: Parasternal long axis (SRT, G-0396)
	[LV] Systole: LV Major, SCLAX	Left Ventricle systolic major axis (LN, 18076-0)	Image View: Subcostal long axis (SRT, G-039E)
X	[LV] Systole: LVID	Left Ventricle Internal Systolic Dimension (LN, 29438-9)	Image View: Parasternal long axis (SRT, G-0396)
	[LV] Systole: LVPW	Left Ventricle Posterior Wall Systolic Thickness (LN, 18156-0)	Image View: Parasternal long axis (SRT, G-0396)
	[LV] TE: LV Mass	Left Ventricle Mass (LN, 18087-7)	Measurement Method: Left Ventricle Mass by Truncated Ellipse (DCM, 125222)
	[LV] TE: LV Mass/BSA	Mass/BSA (99SIEMENS, MassBSAIndex)	Measurement Method: Left Ventricle Mass by Truncated Ellipse (DCM, 125222) Index: Body Surface Area (LN, 8277-6)
	[LV] TE: LV Mass/Ht	Mass/Height (99SIEMENS, MassHtIndex)	Measurement Method: Left Ventricle Mass by Truncated Ellipse (DCM, 125222) Index: Patient Height (LN, 8302-2)
	[LV] Teichholz: LV CI	Cardiac Index (SRT, F-32110)	Measurement Method: Teichholz (DCM, 125209)
	[LV] Teichholz: LV CO	Cardiac Output (SRT, F-32100)	Measurement Method: Teichholz (DCM, 125209)
	[LV] Teichholz: LV EF	Left Ventricular Ejection Fraction (LN, 18043-0)	Measurement Method: Teichholz (DCM, 125209)
	[LV] Teichholz: LV HR	Composite heart rate for LV CO, Teichholz (99SIEMENS, LVHRCOTeich2D)	
	[LV] Teichholz: LV SI	Stroke Index (SRT, F-00078)	Measurement Method: Teichholz (DCM, 125209)
	[LV] Teichholz: LV SV	Stroke Volume (SRT, F-32120)	Measurement Method: Teichholz (DCM, 125209)
	[LV] Teichholz: LV Vol d	Left Ventricular End Diastolic Volume (LN, 18026-5)	Measurement Method: Teichholz (DCM, 125209)
	[LV] Teichholz: LV Vol s	Left Ventricular End Systolic Volume (LN, 18148-7)	Measurement Method: Teichholz (DCM, 125209)
	[LV] Teichholz: LV % FS	Left Ventricular Fractional Shortening (LN, 18051-3)	Measurement Method: Teichholz (DCM, 125209)
	[V] LV A/L, A2C d: LV Vol	Left Ventricular End Diastolic Volume (LN, 18026-5)	Measurement Method: Area-Length Single Plane (DCM, 125205) Image View: Apical two chamber (SRT, G-A19B)
	[V] LV A/L, A2C s: LV Vol	Left Ventricular End Systolic Volume (LN, 18148-7)	Measurement Method: Area-Length Single Plane (DCM, 125205) Image View: Apical two chamber (SRT, G-A19B)
	[V] LV A/L, A4C d: LV Vol	Left Ventricular End Diastolic Volume (LN, 18026-5)	Measurement Method: Area-Length Single Plane (DCM, 125205) Image View: Apical four chamber (SRT, G-A19C)
	[V] LV A/L, A4C s: LV Vol	Left Ventricular End Systolic Volume (LN, 18148-7)	Measurement Method: Area-Length Single Plane (DCM, 125205) Image View: Apical four chamber (SRT, G-A19C)
	[V] LV A/L, Biplane d: LV Vol	Left Ventricular End Diastolic Volume (LN, 18026-5)	Measurement Method: Area-Length Biplane (DCM, 125204)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[V] LV A/L, Biplane s: LV Vol	Left Ventricular End Systolic Volume (LN, 18148-7)	Measurement Method: Area-Length Biplane (DCM, 125204)
	[V] LV MOD, A2C: HR	Composite heart rate for LV CO, MOD A2C (99SIEMENS, LVHRCOA2C)	
	[V] LV MOD, A2C: LV CI	Cardiac Index (SRT, F-32110)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical two chamber (SRT, G-A19B)
	[V] LV MOD, A2C: LV CO	Cardiac Output (SRT, F-32100)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical two chamber (SRT, G-A19B)
	[V] LV MOD, A2C: LV EF	Left Ventricular Ejection Fraction (LN, 18043-0)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical two chamber (SRT, G-A19B)
	[V] LV MOD, A2C: LV SI	Stroke Index (SRT, F-00078)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical two chamber (SRT, G-A19B) Index: Body Surface Area (LN, 8277-6)
	[V] LV MOD, A2C: LV SV	Stroke Volume (SRT, F-32120)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical two chamber (SRT, G-A19B)
	[V] LV MOD, A2C: LV % FAC	Left Ventricular Fractional Area Change (SRT, G-0376)	Image View: Apical two chamber (SRT, G-A19B)
X	[V] LV MOD, A2C d: LV Area	Left Ventricular Diastolic Area (SRT, G-0375)	Image View: Apical two chamber (SRT, G-A19B)
X	[V] LV MOD, A2C d: LV Vol	Left Ventricular End Diastolic Volume (LN, 18026-5)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical two chamber (SRT, G-A19B)
X	[V] LV MOD, A2C d: Major Axis	Left Ventricle diastolic major axis (LN, 18077-8)	Image View: Apical two chamber (SRT, G-A19B)
X	[V] LV MOD, A2C d: Minor Axis	Minor Axis (SRT, G-A194)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B)
	[V] LV MOD, A2C d: Vol/BSA	Volume/BSA (99SIEMENS, VolBSAIndex)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B) Index: Body Surface Area (LN, 8277-6)
X	[V] LV MOD, A2C s: LV Area	Left Ventricular Systolic Area (SRT, G-0374)	Image View: Apical two chamber (SRT, G-A19B)
X	[V] LV MOD, A2C s: LV Vol	Left Ventricular End Systolic Volume (LN, 18148-7)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical two chamber (SRT, G-A19B)
X	[V] LV MOD, A2C s: Major Axis	Left Ventricle systolic major axis (LN, 18076-0)	Image View: Apical two chamber (SRT, G-A19B)
X	[V] LV MOD, A2C s: Minor Axis	Minor Axis (SRT, G-A194)	Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical two chamber (SRT, G-A19B)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[V] LV MOD, A2C s: Vol/BSA	Volume/BSA (99SIEMENS, VolBSAIndex)	Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical two chamber (SRT, G-A19B) Index: Body Surface Area (LN, 8277-6)
	[V] LV MOD, A4C: HR	Composite heart rate for LV CO, MOD A4C (99SIEMENS, LVHRCOA4C)	
	[V] LV MOD, A4C: LV CI	Cardiac Index (SRT, F-32110)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical four chamber (SRT, G-A19C)
	[V] LV MOD, A4C: LV CO	Cardiac Output (SRT, F-32100)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical four chamber (SRT, G-A19C)
	[V] LV MOD, A4C: LV EF	Left Ventricular Ejection Fraction (LN, 18043-0)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical four chamber (SRT, G-A19C)
	[V] LV MOD A4C: LV SI	Stroke Index (SRT, F-00078)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical four chamber (SRT, G-A19C) Index: Body Surface Area (LN, 8277-6)
	[V] LV MOD, A4C: LV SV	Stroke Volume (SRT, F-32120)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical four chamber (SRT, G-A19C)
	[V] LV MOD, A4C: LV % FAC	Left Ventricular Fractional Area Change (SRT, G-0376)	Image View: Apical four chamber (SRT, G-A19C)
X	[V] LV MOD, A4C d: LV Area	Left Ventricular Diastolic Area (SRT, G-0375)	Image View: Apical four chamber (SRT, G-A19C)
X	[V] LV MOD, A4C d: LV Vol	Left Ventricular End Diastolic Volume (LN, 18026-5)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical four chamber (SRT, G-A19C)
X	[V] LV MOD, A4C d: Major Axis	Left Ventricle diastolic major axis (LN, 18077-8)	Image View: Apical four chamber (SRT, G-A19C)
X	[V] LV MOD, A4C d: Minor Axis	Minor Axis (SRT, G-A194)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
X	[V] LV MOD, A4C d: Semi-Maj Axis	Left Ventricle Semi-major Axis Diastolic Dimension (SRT, G-0377)	
X	[V] LV MOD, A4C d: Tr Semi-Maj Axis	Left Ventricle Truncated Semi-major Axis Diastolic Dimension (SRT, G-0378)	
	[V] LV MOD, A4C d: Vol/BSA	Volume/BSA (99SIEMENS, VolBSAIndex)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C) Index: Body Surface Area (LN, 8277-6)
X	[V] LV MOD, A4C s: LV Area	Left Ventricular Systolic Area (SRT, G-0374)	Image View: Apical four chamber (SRT, G-A19C)
X	[V] LV MOD, A4C s: LV Vol	Left Ventricular End Systolic Volume (LN, 18148-7)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical four chamber (SRT, G-A19C)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
X	[V] LV MOD, A4C s: Major Axis	Left Ventricle systolic major axis (LN, 18076-0)	Image View: Apical four chamber (SRT, G-A19C)
X	[V] LV MOD, A4C s: Minor Axis	Minor Axis (SRT, G-A194)	Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C)
	[V] LV MOD, A4C s: Vol/BSA	Volume/BSA (99SIEMENS, VolBSAIndex)	Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C) Index: Body Surface Area (LN, 8277-6)
	[V] LV MOD, Biplane: HR	Composite heart rate for LV CO, MOD Biplane (99SIEMENS, LVHRCOMODBP)	
	[V] LV MOD, Biplane: LV CI	Cardiac Index (SRT, F-32110)	Measurement Method: Method of Disks, Biplane (DCM, 125207)
	[V] LV MOD, Biplane: LV CO	Cardiac Output (SRT, F-32100)	Measurement Method: Method of Disks, Biplane (DCM, 125207)
	[V] LV MOD, Biplane: LV EF	Left Ventricular Ejection Fraction (LN, 18043-0)	Measurement Method: Method of Disks, Biplane (DCM, 125207)
	[V] LV MOD, Biplane: LV SI	Stroke Index (SRT, F-00078)	Measurement Method: Method of Disks, Biplane (DCM, 125207) Index: Body Surface Area (LN, 8277-6)
	[V] LV MOD, Biplane: LV SV	Stroke Volume (SRT, F-32120)	Measurement Method: Method of Disks, Biplane (DCM, 125207)
	[V] LV MOD, Biplane d: LV Vol	Left Ventricular End Diastolic Volume (LN, 18026-5)	Measurement Method: Method of Disks, Biplane (DCM, 125207)
	[V] LV MOD, Biplane d: Vol/BSA	Volume/BSA (99SIEMENS, VolBSAIndex)	Measurement Method: Method of Disks, Biplane (DCM, 125207) Cardiac Cycle Point: Diastole (SRT, F-32010) Index: Body Surface Area (LN, 8277-6)
	[V] LV MOD, Biplane s: LV Vol	Left Ventricular End Systolic Volume (LN, 18148-7)	Measurement Method: Method of Disks, Biplane (DCM, 125207)
	[V] LV MOD, Biplane s: Vol/BSA	Volume/BSA (99SIEMENS, VolBSAIndex)	Measurement Method: Method of Disks, Biplane (DCM, 125207) Cardiac Cycle Point: Systole (SRT, F-32020) Index: Body Surface Area (LN, 8277-6)
	[Not shown]	LV vol, d MOD A2C (disk <n>) (99SIEMENS, LVvdMODA2Cdisk<n>) where <n> = 0..19	
	[Not shown]	LV vol, d MOD A4C (disk <n>) (99SIEMENS, LVvdMODA4Cdisk<n>) where <n> = 0..19	
	[Not shown]	LV vol, s MOD A2C (disk <n>) (99SIEMENS, LVvsMODA2Cdisk<n>) where <n> = 0..19	
	[Not shown]	LV vol, s MOD A4C (disk <n>) (99SIEMENS, LVvsMODA4Cdisk<n>) where <n> = 0..19	
Measurements are associated with CW and PW Doppler, so the image mode is not specified.			
	[Ao] Aortic Valve: LVOT CO	Cardiac Output (SRT, F-32100)	Finding Site: Left Ventricle Outflow Tract (SRT, T-32650)
	[Ao] Aortic Valve: LVOT HR	Composite heart rate for LVOT CO (99SIEMENS, LVOTHRCO)	
	[Ao] Aortic Valve: LVOT Mean Grad	Mean Gradient (LN, 20256-4)	Finding Site: Left Ventricle Outflow Tract (SRT, T-32650)
	[Ao] Aortic Valve: LVOT Pk Grad	Peak Gradient (LN, 20247-3)	Finding Site: Left Ventricle Outflow Tract (SRT, T-32650)
X	[Ao] Aortic Valve: LVOT Vmax	Peak Velocity (LN, 11726-7)	Finding Site: Left Ventricle Outflow Tract (SRT, T-32650)
	[Ao] Aortic Valve: LVOT Vmean	Mean Velocity (LN, 20352-1)	Finding Site: Left Ventricle Outflow Tract (SRT, T-32650)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
X	[Ao] Aortic Valve:LVOT VTI	Velocity Time Integral (LN, 20354-7)	Finding Site: Left Ventricle Outflow Tract (SRT, T-32650)
	[LV] LV dP/dt	Left Ventricle dP/dt (99SIEMENS, LVdPdt)	
	[LV] LV Pressure ed	Pressure (99SIEMENS, Pressure)	Cardiac Cycle Point: End Diastole (SRT, F-32011)
X	[LV] LV ET	Left Ventricular ejection time (DCM, 122211)	
X	[LV] LV IVCT	Left Ventricular Isovolumic Contraction Time (SRT, G-037E)	
	[LV] LV IVRT [D] MV Flow: LV IVRT	Left Ventricular Isovolumic Relaxation Time (LN, 18071-1)	
	[LV] LV Pressure s	Pressure (99SIEMENS, Pressure)	Cardiac Cycle Point: Systole (SRT, F-32020)
	[LV] Myocardial Performance Index: LV MPI	Left Ventricular Index of Myocardial Performance (SRT, G-037F)	
	[LV] Myocardial Performance Index: MV Close-Open Duration	MV Close-Open Duration (99SIEMENS, MVCloseOpenDur)	
	[P] LVOT Inst Flow Rate	Peak Instantaneous Flow Rate (LN, 34141-2)	Finding Site: Left Ventricle Outflow Tract (SRT, T-32650) Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Antegrade Flow (SRT, R-42047)
	[P] LVOT PISA	Flow Area (99SIEMENS, FlowArea)	Finding Site: Left Ventricle Outflow Tract (SRT, T-32650) Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216)
Measurements of Image Mode Doppler Color Flow (SRT, R-409E2)			
	[P] LVOT Aliasing Velocity	Alias Velocity (99SIEMENS, AliasVelocity)	Finding Site: Left Ventricle Outflow Tract (SRT, T-32650)
	[P] LVOT PISA Radius	Flow Radius (99SIEMENS, FlowRadius)	Finding Site: Left Ventricle Outflow Tract (SRT, T-32650) Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216)
Measurements of Image Mode: M mode (SRT, G-0394)			
	[M] EPSS/LVIDd	EPSS to Diastolic LVID Ratio (99SIEMENS, RATIOepss_lvidd)	
	[M] IVS d	Interventricular Septum Diastolic Thickness (LN, 18154-5)	
	[M] IVS s	Interventricular Septum Systolic Thickness (LN, 18158-6)	
	[M] IVS % Thck	Interventricular Septum % Thickening (LN, 18054-7)	
	[M] IVS/LVPW	Interventricular Septum to Posterior Wall Thickness Ratio (LN, 18155-2)	
	[M] LV CI	Cardiac Index (SRT, F-32110)	Index: Body Surface Area (LN, 8277-6)
	[M] LV CO	Cardiac Output (SRT, F-32100)	
	[M] LV EF	Left Ventricular Ejection Fraction (LN, 18043-0)	
X	[M] LV ET	Left Ventricular ejection time (DCM, 122211)	
	[M] LV ETc	Left Ventricular ejection time, corrected (99SIEMENS, ETlvc)	

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[M] LV ET HR	Composite heart rate for M-Mode LV Ejection Time (99SIEMENS, LVHRETMmode)	
	[M] LV HR	Composite heart rate for M-mode LV CO (99SIEMENS, LVHRCOMmode)	
	[M] LV Inflow Vp	Inflow Propagation Velocity Color Mmode (99SIEMENS, InflowProp)	
X	[M] LV PEP	Pre-ejection Period (99SIEMENS, PEP)	
	[M] LV PEPc	Pre-ejection Period, corrected (99SIEMENS, PEPcorr)	
	[M] LV PEPc HR	Composite heart rate for LV Pre-ejection Period, corrected (99SIEMENS, LVHRPEPcorr)	
	[M] LV PEP/ET	Left Ventricular PEP/ET (99SIEMENS, RATIOlvpep_et)	
	[M] LV SI	Stroke Index (SRT, F-00078)	Index: Body Surface Area (LN, 8277-6)
	[M] LV SV	Stroke Volume (SRT, F-32120)	
	[M] LV Vol d	Left Ventricular End Diastolic Volume (LN, 18026-5)	
	[M] LV Vol s	Left Ventricular End Systolic Volume (LN, 18148-7)	
	[M] LV % FS	Left Ventricular Fractional Shortening (LN, 18051-3)	
X	[M] LVID d	Left Ventricle Internal End Diastolic Dimension (LN, 29436-3)	
X	[M] LVID s	Left Ventricle Internal Systolic Dimension (LN, 29438-9)	
	[M] LVPW d	Left Ventricle Posterior Wall Diastolic Thickness (LN, 18152-9)	
	[M] LVPW s	Left Ventricle Posterior Wall Systolic Thickness (LN, 18156-0)	
	[M] LVOT Diam s	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Left Ventricle Outflow Tract (SRT, T-32650) Cardiac Cycle Point: Systole (SRT, F-32020)
	[M] LVPW % Thck	Left Ventricle Posterior Wall % Thickening (LN, 18053-9)	
	[M] Mean Vcfc	Mean Velocity of Circumferential, corrected (99SIEMENS, MeanVcfc)	
	[M] Mean Vcfc HR	Composite HR for LV Mean Velocity of Circumferential, corrected (99SIEMENS, LVHRmeanVcfc)	
	[M] PE d	Pericardial Effusion Diameter (99SIEMENS, DiamPE)	Cardiac Cycle Point: Diastole (SRT, F-32010)
	[M] Wall Stress, Circum	Circumferential Wall Stress (99SIEMENS, WScircum)	
	[M] Wall Stress, Merid	Meridian Wall Stress (99SIEMENS, WSmerid)	
	[M] ASE: LV Mass	Left Ventricle Mass (LN, 18087-7)	Measurement Method: ASE (99SIEMENS, ASE)
	[M] ASE: LV Mass/BSA	Mass/BSA (99SIEMENS, MassBSAIndex)	Measurement Method: ASE (99SIEMENS, ASE)
	[M] ASE: LV Mass/Ht	Mass/Height (99SIEMENS, MassHtIndex)	Measurement Method: ASE (99SIEMENS, ASE)
	[M] ASEcorr: LV Mass	Left Ventricle Mass (LN, 18087-7)	Measurement Method: ASE corrected (99SIEMENS, ASEcorr)
	[M] ASEcorr: LV Mass/BSA	Mass/BSA (99SIEMENS, MassBSAIndex)	Measurement Method: ASE corrected (99SIEMENS, ASEcorr) Index: Body Surface Area (LN, 8277-6)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[M] ASEcorr: LV Mass/Ht	Mass/Height (99SIEMENS, MassHtIndex)	Measurement Method: ASE corrected (99SIEMENS, ASEcorr) Index: Patient Height (LN, 8302-2)

7.1.3 Right Ventricle

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Right Ventricle		Container: Findings (DCM, 121070)	Finding Site: Right Ventricle (SRT, T-32500)
Measurements of Image Mode: 2D mode (SRT, G-03A2)			
X	[RV] RV Major d, A4C [V] RV MOD, A4C d: Major Axis	Major Axis (SRT, G-A193)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
X	[RV] RV Major s, A4C [V] RV MOD, A4C s: Major Axis	Major Axis (SRT, G-A193)	Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C)
X	[RV] RV Minor d, A4C	Minor Axis (SRT, G-A194)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
X	[RV] RV Minor s, A4C	Minor Axis (SRT, G-A194)	Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C)
	[RV] RVAW d, PLAX	Right Ventricular Anterior Wall Diastolic Thickness (LN, 18153-7)	Image View: Parasternal long axis (SRT, G-0396)
	[RV] RVAW s, PLAX	Right Ventricular Anterior Wall Systolic Thickness (LN, 18157-8)	Image View: Parasternal long axis (SRT, G-0396)
	[RV] RVD d, PLAX	Right Ventricular Internal Diastolic Dimension (LN, 20304-2)	Image View: Parasternal long axis (SRT, G-0396)
	[RV] RVD s, PLAX	Right Ventricular Internal Systolic Dimension (LN, 20305-9)	Image View: Parasternal long axis (SRT, G-0396)
	[RV] RVOT area	Cardiovascular Orifice Area (SRT, G-038E)	Finding Site: Right Ventricle Outflow Tract (SRT, T-32550)
X	[RV] RVOT Diam s	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Right Ventricle Outflow Tract (SRT, T-32550) Cardiac Cycle Point: Systole (SRT, F-32020)
	[RV] RVOT Diam s, SCLAX	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Right Ventricle Outflow Tract (SRT, T-32550) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Subcostal long axis (SRT, G-039E)
	[V] RV MOD, A2C: RV EF	Right Ventricular Ejection Fraction (99SIEMENS, RVEF)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical two chamber (SRT, G-A19B)
	[V] RV MOD, A2C d: RV Area	Area (SRT, G-A166)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B)
X	[V] RV MOD, A2C d: Major Axis	Major Axis (SRT, G-A193)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[V] RV MOD, A2C, d: RV Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B)
	[Not shown]	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B) Simpson Disk Number: <n> where <n> = 0..19
	[V] RV MOD, A2C s: RV Area	Area (SRT, G-A166)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical two chamber (SRT, G-A19B)
X	[V] RV MOD, A2C s: Major Axis	Major Axis (SRT, G-A193)	Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical two chamber (SRT, G-A19B)
	[V] RV MOD, A2C, s: RV Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical two chamber (SRT, G-A19B)
	[Not shown]	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical two chamber (SRT, G-A19B) Simpson Disk Number: <n> where <n> = 0..19
	[V] RV MOD, A4C: RV EF	Right Ventricular Ejection Fraction (99SIEMENS, RVEF)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical four chamber (SRT, G-A19C)
	[V] RV MOD, A4C d: RV Area	Area (SRT, G-A166)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
	[V] RV MOD, A4C d: RV Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[Not shown]	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C) Simpson Disk Number: <n> where <n> = 0..19
	[V] RV MOD, A4C s: RV Area	Area (SRT, G-A166)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C)
	[V] RV MOD, A4C s: RV Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C)
	[Not shown]	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C) Simpson Disk Number: <n> where <n> = 0..19
	[V] RV MOD, Biplane: RV EF	Right Ventricular Ejection Fraction (99SIEMENS, RVEF)	Measurement Method: Method of Disks, Biplane (DCM, 125207)
	[V] RV MOD, Biplane d: RV Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Biplane (DCM, 125207) Cardiac Cycle Point: Diastole (SRT, F-32010)
	[V] RV MOD, Biplane s: RV Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Biplane (DCM, 125207) Cardiac Cycle Point: Systole (SRT, F-32020)
Measurements are associated with CW and PW Doppler, so the image mode is not specified.			
	[P] RVOT Inst Flow Rate	Peak Instantaneous Flow Rate (LN, 34141-2)	Finding Site: Right Ventricle Outflow Tract (SRT, T-32550) Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Antegrade Flow (SRT, R-42047)
	[P] RVOT PISA	Flow Area (99SIEMENS, FlowArea)	Finding Site: Right Ventricle Outflow Tract (SRT, T-32550) Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216)
	[RV] RV dP/dt	Tricuspid Regurgitation dP/dt (LN, 18034-9)	
	[RV] RV Free Wall: E/E' [D] PW DTI, RV Free Wall: E/E'	Ratio of TV E Vmax to RV Free Wall Ea (99SIEMENS, RatioRVEePrime)	
X	[RV] RVOT Mean Grad	Mean Gradient (LN, 20256-4)	Finding Site: Right Ventricle Outflow Tract (SRT, T-32550)
	[RV] RVOT Pk Grad	Peak Gradient (LN, 20247-3)	Finding Site: Right Ventricle Outflow Tract (SRT, T-32550)
	[RV] RVOT Vmax	Peak Velocity (LN, 11726-7)	Finding Site: Right Ventricle Outflow Tract (SRT, T-32550)
	[RV] RVOT Vmean	Mean Velocity (LN, 20352-1)	Finding Site: Right Ventricle Outflow Tract (SRT, T-32550)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
X	[RV] RVOT VTI	Velocity Time Integral (LN, 20354-7)	Finding Site: Right Ventricle Outflow Tract (SRT, T-32550)
	[RV] Myocardial Performance Index: RV MPI	Right Ventricular Index of Myocardial Performance (SRT, G-0381)	
	[RV] Myocardial Performance Index: TV Close-Open Duration	TV Close-Open Duration (99SIEMENS, TVCloseOpenDur)	
	[RV] RVSP: RVSP (TR)	Right Ventricular Peak Systolic Pressure (SRT, G-0380)	Finding Site: Tricuspid Valve (SRT, T-35100) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[RV] RVSP: RVSP (VSD)	Right Ventricular Peak Systolic Pressure (SRT, G-0380)	Finding Site: Ventricular Septal Defect (SRT, D4-31150)
Measurements of Image Mode Doppler Color Flow (SRT, R-409E2)			
	[P] RVOT Aliasing Velocity	Alias Velocity (99SIEMENS, AliasVelocity)	Finding Site: Right Ventricle Outflow Tract (SRT, T-32550)
	[P] RVOT PISA Radius	Flow Radius (99SIEMENS, FlowRadius)	Finding Site: Right Ventricle Outflow Tract (SRT, T-32550) Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216)
Measurements of Image Mode Doppler Pulsed (SRT, R-409E4)			
	[RV] RV Free Wall: E' [D] PW DTI, RV Free Wall: E'	RV Free Wall Ea (99SIEMENS, RVePrime)	
Measurements of Image Mode: M mode (SRT, G-0394)			
X	[M] RV ET	Right Ventricular ejection time (DCM, 122213)	
	[M] RV ETc	Right Ventricular ejection time, corrected (99SIEMENS, ETrvc)	
	[M] RV Inflow Vp	Inflow Propagation Velocity Color Mmode (99SIEMENS, InflowProp)	
X	[M] RV PEP	Pre-ejection Period (99SIEMENS, PEP)	
	[M] RV PEPc	Pre-ejection Period, corrected (99SIEMENS, PEPcorr)	
	[M] RV PEPc HR	Composite heart rate for RV Pre-ejection Period, corrected (99SIEMENS, RVHRPEPcorr)	
	[M] RV PEP/ET	Right Ventricular PEP/ET (99SIEMENS, RATIOrvpep_et)	
	[M] RVAW d	Right Ventricular Anterior Wall Diastolic Thickness (LN, 18153-7)	
	[M] RVAW s	Right Ventricular Anterior Wall Systolic Thickness (LN, 18157-8)	
	[M] RVD d	Right Ventricular Internal Diastolic Dimension (LN, 20304-2)	
	[M] RVD s	Right Ventricular Internal Systolic Dimension (LN, 20305-9)	

7.1.4 Left Atrium

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Left Atrium		Container: Findings (DCM, 121070)	Finding Site: Left Atrium (SRT, T-32300)
Measurements of Image Mode: 2D mode (SRT, G-03A2)			
	[LA] Ao d/LA s	End Diastolic Aortic Root to End Systolic Left Atrium Ratio (99SIEMENS, RATIOaod_las)	
	[LA] LA A/P s	Left Atrium Antero-posterior Systolic Dimension (LN, 29469-4)	
	[LA] LA s/Ao d	Left Atrium to Aortic Root Ratio (LN, 17985-3)	
X	[LA] Diastole: Major Diam (A2C) [V] LA MOD, A2C d: Major Axis	Major Axis (SRT, G-A193)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B)
X	[LA] Diastole: Major Diam (A4C) [V] LA MOD, A4C d: Major Axis	Major Axis (SRT, G-A193)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
X	[LA] Diastole: Major Diam (PLAX)	Major Axis (SRT, G-A193)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Parasternal long axis (SRT, G-0396)
X	[LA] Diastole: Minor Diam (A4C)	Minor Axis (SRT, G-A194)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
X	[LA] Systole: Major Diam (A2C) [V] LA MOD, A2C s: Major Axis	Major Axis (SRT, G-A193)	Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical two chamber (SRT, G-A19B)
X	[LA] Systole: Major Diam (A4C) [V] LA MOD, A4C s: Major Axis	Major Axis (SRT, G-A193)	Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C)
X	[LA] Systole: Major Diam (PLAX)	Major Axis (SRT, G-A193)	Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Parasternal long axis (SRT, G-0396)
X	[LA] Systole: Minor Diam (A4C)	Minor Axis (SRT, G-A194)	Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C)
	[V] LA A/L, A2C d: LA Vol	Volume (SRT, G-D705)	Measurement Method: Area-Length Single Plane (DCM, 125205) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B)
	[V] LA A/L, A2C d: LA Vol/BSA	Volume (SRT, G-D705)	Measurement Method: Area-Length Single Plane (DCM, 125205) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B) Index: Body Surface Area (LN, 8277-6)
	[V] LA A/L, A2C s: LA Vol	Left Atrium Systolic Volume (SRT, G-0383)	Measurement Method: Area-Length Single Plane (DCM, 125205) Image View: Apical two chamber (SRT, G-A19B)
	[V] LA A/L, A2C s: LA Vol/BSA	Left Atrium Systolic Volume (SRT, G-0383)	Measurement Method: Area-Length Single Plane (DCM, 125205) Image View: Apical two chamber (SRT, G-A19B) Index: Body Surface Area (LN, 8277-6)
	[V] LA A/L, A4C d: LA Vol	Volume (SRT, G-D705)	Measurement Method: Area-Length Single Plane (DCM, 125205) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[V] LA A/L, A4C d: LA Vol/BSA	Volume (SRT, G-D705)	Measurement Method: Area-Length Single Plane (DCM, 125205) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C) Index: Body Surface Area (LN, 8277-6)
	[V] LA A/L, A4C s: LA Vol	Left Atrium Systolic Volume (SRT, G-0383)	Measurement Method: Area-Length Single Plane (DCM, 125205) Image View: Apical four chamber (SRT, G-A19C)
	[V] LA A/L, A4C s: LA Vol/BSA	Left Atrium Systolic Volume (SRT, G-0383)	Measurement Method: Area-Length Single Plane (DCM, 125205) Image View: Apical four chamber (SRT, G-A19C) Index: Body Surface Area (LN, 8277-6)
	[V] LA A/L, Biplane d: LA Vol	Volume (SRT, G-D705)	Measurement Method: Area-Length Biplane (DCM, 125204) Cardiac Cycle Point: Diastole (SRT, F-32010)
	[V] LA A/L, Biplane d: LA Vol/BSA	Volume/BSA (99SIEMENS, VolBSAIndex)	Measurement Method: Area-Length Biplane (DCM, 125204) Cardiac Cycle Point: Diastole (SRT, F-32010) Index: Body Surface Area (LN, 8277-6)
	[V] LA A/L, Biplane s: LA Vol/BSA	Volume/BSA (99SIEMENS, VolBSAIndex)	Measurement Method: Area-Length Biplane (DCM, 125204) Cardiac Cycle Point: Systole (SRT, F-32020) Index: Body Surface Area (LN, 8277-6)
	[V] LA A/L, Biplane s: LA Vol	Left Atrium Systolic Volume (SRT, G-0383)	Measurement Method: Area-Length Biplane (DCM, 125204)
	[V] LA MOD, A2C d: LA Area	Area (SRT, G-A166)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B)
	[V] LA MOD, A2C d: LA Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B)
	[Not shown]	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B) Simpson Disk Number: <n> where <n> = 0..19
	[V] LA MOD, A2C s: LA Area	Left Atrium Systolic Area (LN, 17977-0)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical two chamber (SRT, G-A19B)
	[V] LA MOD, A2C s: LA Vol	Left Atrium Systolic Volume (SRT, G-0383)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical two chamber (SRT, G-A19B)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[Not shown]	Left Atrium Systolic Volume (SRT, G-0383)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical two chamber (SRT, G-A19B) Simpson Disk Number: <n> where <n> = 0..19
	[V] LA MOD, A4C d: LA Area	Area (SRT, G-A166)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
	[V] LA MOD, A4C d: LA Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
	[Not shown]	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C) Simpson Disk Number: <n> where <n> = 0..19
	[V] LA MOD, A4C s: LA Area	Left Atrium Systolic Area (LN, 17977-0)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical four chamber (SRT, G-A19C)
	[V] LA MOD, A4C s: LA Vol	Left Atrium Systolic Volume (SRT, G-0383)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical four chamber (SRT, G-A19C)
	[Not shown]	Left Atrium Systolic Volume (SRT, G-0383)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical four chamber (SRT, G-A19C) Simpson Disk Number: <n> where <n> = 0..19
	[V] LA MOD, Biplane d: LA Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Biplane (DCM, 125207) Cardiac Cycle Point: Diastole (SRT, F-32010)
	[V] LA MOD, Biplane s: LA Vol	Left Atrium Systolic Volume (SRT, G-0383)	Measurement Method: Method of Disks, Biplane (DCM, 125207)
Measurements of Image Mode: M mode (SRT, G-0394)			
	[M] Ao d/LA s	End Diastolic Aortic Root to End Systolic Left Atrium Ratio (99SIEMENS, RATIOaod_las)	
	[M] LA Diam d	Diameter (SRT, M-02550)	Cardiac Cycle Point: Diastole (SRT, F-32010)
	[M] LA Diam s	Left Atrium Antero-posterior Systolic Dimension (LN, 29469-4)	
	[M] LA s/Ao d	Left Atrium to Aortic Root Ratio (LN, 17985-3)	

7.1.5 Right Atrium

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Right Atrium		Container: Findings (DCM, 121070)	Finding Site: Right Atrium (SRT, T-32200)
Measurements of Image Mode: 2D mode (SRT, G-03A2)			
X	[RA] Diastole: Major Diam (A2C) [V] RA MOD, A2C d: Major Axis	Major Axis (SRT, G-A193)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B)
X	[RA] Diastole: Major Diam (A4C) [V] RA MOD, A4C d: Major Axis	Major Axis (SRT, G-A193)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
X	[RA] Diastole: Minor Diam (A4C)	Minor Axis (SRT, G-A194)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
X	[RA] Systole: Major Diam (A2C) [V] RA MOD, A2C s: Major Axis	Major Axis (SRT, G-A193)	Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical two chamber (SRT, G-A19B)
X	[RA] Systole: Major Diam (A4C) [V] RA MOD, A4C s: Major Axis	Major Axis (SRT, G-A193)	Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C)
X	[RA] Systole: Minor Diam (A4C)	Minor Axis (SRT, G-A194)	Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C)
	[RV] RVSP: RA Pressure	Right Atrium Systolic Pressure (LN, 18070-3)	
	[V] RA A/L, A2C d: RA Vol	Volume (SRT, G-D705)	Measurement Method: Area-Length Single Plane (DCM, 125205) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B)
	[V] RA A/L, A2C d: RA Vol/BSA	Volume (SRT, G-D705)	Measurement Method: Area-Length Single Plane (DCM, 125205) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B) Index: Body Surface Area (LN, 8277-6)
	[V] RA A/L, A2C s: RA Vol	Volume (SRT, G-D705)	Measurement Method: Area-Length Single Plane (DCM, 125205) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical two chamber (SRT, G-A19B)
	[V] RA A/L, A2C s: RA Vol/BSA	Volume (SRT, G-D705)	Measurement Method: Area-Length Single Plane (DCM, 125205) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical two chamber (SRT, G-A19B) Index: Body Surface Area (LN, 8277-6)
	[V] RA A/L, A4C d: RA Vol	Volume (SRT, G-D705)	Measurement Method: Area-Length Single Plane (DCM, 125205) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
	[V] RA A/L, A4C d: RA Vol/BSA	Volume (SRT, G-D705)	Measurement Method: Area-Length Single Plane (DCM, 125205) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C) Index: Body Surface Area (LN, 8277-6)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[V] RA A/L, A4C s: RA Vol	Volume (SRT, G-D705)	Measurement Method: Area-Length Single Plane (DCM, 125205) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C)
	[V] RA A/L, A4C s: RA Vol/BSA	Volume (SRT, G-D705)	Measurement Method: Area-Length Single Plane (DCM, 125205) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C) Index: Body Surface Area (LN, 8277-6)
	[V] RA A/L, Biplane d: RA Vol	Volume (SRT, G-D705)	Measurement Method: Area-Length Biplane (DCM, 125204) Cardiac Cycle Point: Diastole (SRT, F-32010)
	[V] RA A/L, Biplane d: RA Vol/BSA	Volume (SRT, G-D705)	Measurement Method: Area-Length Biplane (DCM, 125204) Cardiac Cycle Point: Diastole (SRT, F-32010) Index: Body Surface Area (LN, 8277-6)
	[V] RA A/L, Biplane s: RA Vol	Volume (SRT, G-D705)	Measurement Method: Area-Length Biplane (DCM, 125204) Cardiac Cycle Point: Systole (SRT, F-32020)
	[V] RA A/L, Biplane s: RA Vol/BSA	Volume (SRT, G-D705)	Measurement Method: Area-Length Biplane (DCM, 125204) Cardiac Cycle Point: Systole (SRT, F-32020) Index: Body Surface Area (LN, 8277-6)
	[V] RA MOD, A2C d: RA Area	Area (SRT, G-A166)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B)
	[V] RA MOD, A2C d: RA Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B)
	[Not shown]	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B) Simpson Disk Number: <n> where <n> = 0..19
	[V] RA MOD, A2C s: RA Area	Right Atrium Systolic Area (LN, 17988-7)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical two chamber (SRT, G-A19B)
	[V] RA MOD, A2C s: RA Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical two chamber (SRT, G-A19B)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[Not shown]	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical two chamber (SRT, G-A19B) Simpson Disk Number: <n> where <n> = 0..19
	[V] RA MOD, A4C d: RA Area	Area (SRT, G-A166)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
	[V] RA MOD, A4C d: RA Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
	[Not shown]	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C) Simpson Disk Number: <n> where <n> = 0..19
	[V] RA MOD, A4C s: RA Area	Right Atrium Systolic Area (LN, 17988-7)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Image View: Apical four chamber (SRT, G-A19C)
	[V] RA MOD, A4C s: RA Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C)
	[Not shown]	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Single Plane (DCM, 125208) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C) Simpson Disk Number: <n> where <n> = 0..19
	[V] RA MOD, Biplane d: RA Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Biplane (DCM, 125207) Cardiac Cycle Point: Diastole (SRT, F-32010)
	[V] RA MOD, Biplane s: RA Vol	Volume (SRT, G-D705)	Measurement Method: Method of Disks, Biplane (DCM, 125207) Cardiac Cycle Point: Systole (SRT, F-32020)

7.1.6 Aortic Valve

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Aortic Valve		Container: Findings (DCM, 121070)	Finding Site: Left Atrium (SRT, T-35400)
Measurements of Image Mode: 2D mode (SRT, G-03A2)			
X	[Ao] Aortic Valve: AoV Ann Diam	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Aortic Valve Ring (SRT, T-35410)
	[Ao] Aortic Valve: AoV Area, Planim	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Planimetry (DCM, 125220)
Measurements are associated with CW and PW Doppler, so the image mode is not specified.			
X	[Ao] Aortic Valve: AoV Accel Slope	Acceleration Slope (99SIEMENS, AccelSlope)	
	[Ao] Aortic Valve: AoV Area (Vmax)	Area (SRT, G-A166)	Measurement Method: Continuity Equation by Peak Velocity (DCM, 125214)
	[Ao] Aortic Valve: AoV Area (Vmn)	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Continuity Equation by Mean Velocity (DCM, 125213)
	[Ao] Aortic Valve: AoV Area (VTI)	Area (SRT, G-A166)	Measurement Method: Continuity Equation by Velocity Time Integral (DCM, 125215)
	[Ao] Aortic Valve: AoV Area/BSA (Vmax)	Area/BSA (99SIEMENS, AreaBSAIndex)	Measurement Method: Continuity Equation by Peak Velocity (DCM, 125214) Index: Body Surface Area (LN, 8277-6)
	[Ao] Aortic Valve: AoV Area/BSA (Vmn)	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Continuity Equation by Mean Velocity (DCM, 125213) Index: Body Surface Area (LN, 8277-6)
	[Ao] Aortic Valve: AoV Area/BSA (VTI)	Area/BSA (99SIEMENS, AreaBSAIndex)	Measurement Method: Continuity Equation by Velocity Time Integral (DCM, 125215) Index: Body Surface Area (LN, 8277-6)
X	[Ao] Aortic Valve: AoV AT	Acceleration Time (LN, 20168-1)	
	[Ao] Aortic Valve: AoV AT/ET	Ratio of Aortic Valve Acceleration Time to Ejection Time (SRT, G-0382)	
X	[Ao] Aortic Valve: AoV ET [LV] Myocardial Performance Index: AoV ET	Aortic Valve Ejection Time (LN, 18041-4)	
X	[Ao] Aortic Valve: AoV Mean Grad	Mean Gradient (LN, 20256-4)	
	[Ao] Aortic Valve: AoV Pk Grad	Peak Gradient (LN, 20247-3)	
X	[Ao] Aortic Valve: AoV Vmax [P] AoV Vmax	Peak Velocity (LN, 11726-7)	
	[Ao] Aortic Valve: AoV Vmean	Mean Velocity (LN, 20352-1)	
X	[Ao] Aortic Valve: AoV VTI	Velocity Time Integral (LN, 20354-7)	
	[Ao] Aortic Valve: AR DT	Deceleration Time (LN, 20217-6)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[Ao] Aortic Valve: AR ed Grad	Peak Gradient (LN, 20247-3)	Flow Direction: Regurgitant Flow (SRT, R-42E61) Cardiac Cycle Point: End Diastole (SRT, F-32011)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
X	[Ao] Aortic Valve: AR ed Vel	End Diastolic Velocity (LN, 11653-3)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[Ao] Aortic Valve: AR P1/2 Time	Pressure Half-Time (LN, 20280-4)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[Ao] Aortic Valve: AR Slope	Deceleration Slope (LN, 20216-8)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[Ao] Aortic Valve: AR Vmax [P] AR Vmax	Peak Velocity (LN, 11726-7)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[Ao] Aortic Valve: AR VTI [P] AR VTI	Velocity Time Integral (LN, 20354-7)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] AoV Area (PISA)	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Antegrade Flow (SRT, R-42047)
	[P] AoV Area/BSA (PISA)	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Antegrade Flow (SRT, R-42047) Index: Body Surface Area (LN, 8277-6)
	[P] AR Eff ROA	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] AR Inst Flow Rate	Peak Instantaneous Flow Rate (LN, 34141-2)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] AR PISA	Flow Area (99SIEMENS, FlowArea)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] AR Volume	Volume Flow (LN, 33878-0)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
Measurements of Image Mode Doppler Color Flow (SRT, R-409E2)			
	[P] AR Aliasing Velocity	Alias Velocity (99SIEMENS, AliasVelocity)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] AR PISA Radius	Flow Radius (99SIEMENS, FlowRadius)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
Measurements of Image Mode: M mode (SRT, G-0394)			
	[M] AoV Cusp Sep	Aortic Valve Cusp Separation (LN, 17996-0)	

7.1.7 Mitral Valve

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Mitral Valve		Container: Findings (DCM, 121070)	Finding Site: Mitral Valve (SRT, T-35300)
Measurements of Image Mode: 2D mode (SRT, G-03A2)			
	[MV] MV Ann d, A/P	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Mitral Annulus (SRT, T-35313) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Parasternal long axis (SRT, G-0396)
	[MV] MV Area, Planim	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Planimetry (DCM, 125220)
	[MV] MV Diam, A/P	Cardiovascular Orifice Diameter (SRT, G-038F)	Image View: Parasternal long axis (SRT, G-0396)
	[MV] MV Diam, M/L	Cardiovascular Orifice Diameter (SRT, G-038F)	Image View: Apical four chamber (SRT, G-A19C)
	[MV] Diastole: MV Ann, A2C	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Mitral Annulus (SRT, T-35313) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical two chamber (SRT, G-A19B)
	[MV] Diastole: MV Ann, A4C	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Mitral Annulus (SRT, T-35313) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
	[MV] Diastole: MV Ann, PLAX	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Mitral Annulus (SRT, T-35313) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Parasternal long axis (SRT, G-0396)
	[MV] Systole: MV Ann, A2C	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Mitral Annulus (SRT, T-35313) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical two chamber (SRT, G-A19B)
	[MV] Systole: MV Ann, A4C	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Mitral Annulus (SRT, T-35313) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Apical four chamber (SRT, G-A19C)
	[MV] Systole: MV Ann, PLAX	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Mitral Annulus (SRT, T-35313) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Parasternal long axis (SRT, G-0396)
Measurements are associated with CW and PW Doppler, so the image mode is not specified.			
X	[MV] MR Mn Grad	Mean Gradient (LN, 20256-4)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[MV] MR Pk Grad	Peak Gradient (LN, 20247-3)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[MV] MR Vmax [P] MR Vmax	Peak Velocity (LN, 11726-7)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
X	[MV] MR VTI [P] MR VTI	Velocity Time Integral (LN, 20354-7)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[MV] MV A dur [D] MV Flow: MV A dur	Mitral Valve A-Wave Duration (SRT, G-0385)	
	[MV] MV A Vmax [D] MV Flow: MV A Vmax	Mitral Valve A-Wave Peak Velocity (LN, 17978-8)	

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
X	[MV] MV Accel Slope	Acceleration Slope (99SIEMENS, AccelSlope)	
	[MV] MV Area, P1/2 Time	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Area by Pressure Half-Time (DCM, 125210)
X	[MV] MV AT	Acceleration Time (LN, 20168-1)	
	[MV] MV A/E [D] MV Flow: MV A/E	Mitral Valve A to E Ratio (99SIEMENS, MVAtoERatio)	
X	[MV] MV Decel Slope	Deceleration Slope (LN, 20216-8)	
	[MV] MV DT [D] MV Flow: MV DT	Deceleration Time (LN, 20217-6)	
	[MV] MV E Vmax [D] MV Flow: MV E Vmax	Mitral Valve E-Wave Peak Velocity (LN, 18037-2)	
	[MV] MV E/A [D] MV Flow: MV E/A	Mitral Valve E to A Ratio (LN, 18038-0)	
	[MV] MV Lateral E/E' [D] PW DTI, MV Lateral: E/E'	Mitral Valve E to Ea Ratio, lateral (99SIEMENS, MVEtoEaRatioLat)	
	[MV] MV Medial E/E' [D] PW DTI, MV Medial: E/E'	Mitral Valve E to Ea Ratio, medial (99SIEMENS, MVEtoEaRatioMed)	
X	[MV] MV Mn Grad	Mean Gradient (LN, 20256-4)	
	[MV] MV P1/2 Time	Pressure Half-Time (LN, 20280-4)	
	[MV] MV Pk Grad	Peak Gradient (LN, 20247-3)	
	[MV] MV Regurg Vol	Volume (SRT, G-D705)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[MV] MV RF	Regurgitant Fraction (SRT, G-0390)	
	[MV] MV SV	Stroke Volume (SRT, F-32120)	
	[MV] MV Vmax [P] MV Vmax	Peak Velocity (LN, 11726-7)	
X	[MV] MV VTI, Annulus	Velocity Time Integral (LN, 20354-7)	Finding Site: Mitral Annulus (SRT, T-35313)
X	[MV] MV VTI, Tips [D] MV Flow: MV VTI, Tips	Velocity Time Integral (LN, 20354-7)	Finding Site: Leaflet Tips (99SIEMENS, Leaflet Tips)
	[P] MR Eff ROA	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] MR Inst Flow Rate	Peak Instantaneous Flow Rate (LN, 34141-2)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] MR PISA	Flow Area (99SIEMENS, FlowArea)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[P] MR Volume	Volume Flow (LN, 33878-0)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] MV Area (PISA)	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Antegrade Flow (SRT, R-42047)
	[P] MV Area/BSA (PISA)	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Antegrade Flow (SRT, R-42047) Index: Body Surface Area (LN, 8277-6)
	[P] MV Inst Flow Rate	Peak Instantaneous Flow Rate (LN, 34141-2)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Antegrade Flow (SRT, R-42047)
	[P] MV PISA	Flow Area (99SIEMENS, FlowArea)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Antegrade Flow (SRT, R-42047)
Measurements of Image Mode Doppler Color Flow (SRT, R-409E2)			
	[P] MR Aliasing Velocity	Alias Velocity (99SIEMENS, AliasVelocity)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
X	[P] MR PISA Radius	Flow Radius (99SIEMENS, FlowRadius)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] MV Aliasing Velocity	Alias Velocity (99SIEMENS, AliasVelocity)	Flow Direction: Antegrade Flow (SRT, R-42047)
	[P] MV Funnel Angle	Funnel Angle (99SIEMENS, FunnelAngle)	
	[P] MV PISA Radius	Flow Radius (99SIEMENS, FlowRadius)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216)
Measurements of Image Mode: Doppler Pulsed (SRT, R-409E4)			
	[MV] MV Lateral A' [D] PW DTI, MV Lateral: A'	Late Diastolic Myocardial Velocity, lateral (99SIEMENS, AaVelocityLat)	
	[MV] MV Lateral E' [D] PW DTI, MV Lateral: E'	Early Diastolic Myocardial Velocity, lateral (99SIEMENS, EaVelocityLat)	
	[MV] MV Lateral S' [D] PW DTI, MV Lateral: S'	Systolic Myocardial Velocity, lateral (99SIEMENS, SaVelocityLat)	
	[MV] MV Medial A' [D] PW DTI, MV Medial: A'	Late Diastolic Myocardial Velocity, medial (99SIEMENS, AaVelocityMed)	
	[MV] MV Medial E' [D] PW DTI, MV Medial: E'	Early Diastolic Myocardial Velocity, medial (99SIEMENS, EaVelocityMed)	
	[MV] MV Medial S' [D] PW DTI, MV Medial: S'	Systolic Myocardial Velocity, medial (99SIEMENS, SaVelocityMed)	

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Measurements of Image Mode: M mode (SRT, G-0394)			
	[M] CA Amp	Amplitude of C point to A point (99SIEMENS, MVCAAmp)	
	[M] CE Amp	Amplitude of C point to E point (99SIEMENS, MVCEAmp)	
	[M] DE Amp	Amplitude of D point to E point (99SIEMENS, MVDEAmp)	
	[M] MV EF Slope	Mitral Valve E-F Slope by M-Mode (LN, 18040-6)	
	[M] MV EPSS	Mitral Valve EPSS, E wave (LN, 18036-4)	
	[M] MV D-E Excursion	Mitral Valve D-E Excursion (LN, 17997-8)	
	[M] MV DE Slope	D to E point Slope (99SIEMENS, DESlope)	

7.1.8 Pulmonic Valve

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Pulmonic Valve		Container: Findings (DCM, 121070)	Finding Site: Pulmonic Valve (SRT, T-35200)
Measurements of Image Mode: 2D mode (SRT, G-03A2)			
	[PV] PV Ann Diam	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Pulmonic Valve Annulus (99SIEMENS, PVAnnulus)
	[PV] PV Ann Diam s, PSAX	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Pulmonic Valve Annulus (99SIEMENS, PVAnnulus) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Parasternal short axis (SRT, G-0397)
Measurements are associated with CW and PW Doppler, so the image mode is not specified.			
	[PV] PR DT	Deceleration Time (LN, 20217-6)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[PV] PR ed Grad	Peak Gradient (LN, 20247-3)	Flow Direction: Regurgitant Flow (SRT, R-42E61) Cardiac Cycle Point: End Diastole (SRT, F-32011)
X	[PV] PR ed Vel	End Diastolic Velocity (LN, 11653-3)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[PV] PR Slope	Deceleration Slope (LN, 20216-8)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[PV] PR Vmax [P] PR Vmax	Peak Velocity (LN, 11726-7)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[PV] PR VTI	Velocity Time Integral (LN, 20354-7)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[PV] PV Area (Vmax)	Pulmonic Valve Area by continuity (LN, 18096-8)	Measurement Method: Continuity Equation by Peak Velocity (DCM, 125214)
	[PV] PV Area (VTI)	Pulmonic Valve Area by continuity (LN, 18096-8)	Measurement Method: Continuity Equation by Velocity Time Integral (DCM, 125215)
	[PV] PV Area/BSA (Vmax)	Area/BSA (99SIEMENS, AreaBSAIndex)	Measurement Method: Continuity Equation by Peak Velocity (DCM, 125214) Index: Body Surface Area (LN, 8277-6)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[PV] PV Area/BSA (VTI)	Area/BSA (99SIEMENS, AreaBSAIndex)	Measurement Method: Continuity Equation by Velocity Time Integral (DCM, 125215) Index: Body Surface Area (LN, 8277-6)
X	[PV] PV AT	Acceleration Time (LN, 20168-1)	
	[PV] PV AT/ET	Ratio of Pulmonic Valve Acceleration Time to Ejection Time (SRT, G-0388)	
X	[PV] PV ET [RV] Myocardial performance Index: PV ET	Pulmonic Valve Ejection Time (LN, 18042-2)	
X	[PV] PV Mn Grad	Mean Gradient (LN, 20256-4)	
	[PV] PV Pk Grad	Peak Gradient (LN, 20247-3)	
	[PV] PV SV	Stroke Volume (SRT, F-32120)	
X	[PV] PV Vmax [P] PV Vmax	Peak Velocity (LN, 11726-7)	
	[PV] PV Vmean	Mean Velocity (LN, 20352-1)	
X	[PV] PV VTI	Velocity Time Integral (LN, 20354-7)	
	[P] PR Eff ROA	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] PR Inst Flow Rate	Peak Instantaneous Flow Rate (LN, 34141-2)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] PR PISA	Flow Area (99SIEMENS, FlowArea)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] PV Area (PISA)	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Antegrade Flow (SRT, R-42047)
	[P] PV Area/BSA (PISA)	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Antegrade Flow (SRT, R-42047) Index: Body Surface Area (LN, 8277-6)
Measurements of Image Mode Doppler Color Flow (SRT, R-409E2)			
	[P] PR Aliasing Velocity	Alias Velocity (99SIEMENS, AliasVelocity)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] PR PISA Radius	Flow Radius (99SIEMENS, FlowRadius)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)

7.1.9 Tricuspid Valve

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Tricuspid Valve		Container: Findings (DCM, 121070)	Finding Site: Tricuspid Valve (SRT, T-35100)
Measurements of Image Mode: 2D mode (SRT, G-03A2)			
	[TV] TV Ann d, A/P	Cardiovascular Orifice Diameter (SRT, G-038F)	Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Parasternal long axis (SRT, G-0396)
	[TV] TV Ann d, A4C	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Tricuspid Annulus (SRT, T-35111) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Apical four chamber (SRT, G-A19C)
	[TV] TV Area, Planim	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Planimetry (DCM, 125220)
Measurements are associated with CW and PW Doppler, so the image mode is not specified.			
	[P] TR Eff ROA	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] TR Inst Flow Rate	Peak Instantaneous Flow Rate (LN, 34141-2)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] TR PISA	Flow Area (99SIEMENS, FlowArea)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] TV Area (PISA)	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Antegrade Flow (SRT, R-42047)
	[P] TV Area/BSA (PISA)	Cardiovascular Orifice Area (SRT, G-038E)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Antegrade Flow (SRT, R-42047) Index: Body Surface Area (LN, 8277-6)
	[P] TV Inst Flow Rate	Peak Instantaneous Flow Rate (LN, 34141-2)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Antegrade Flow (SRT, R-42047)
	[P] TV PISA	Flow Area (99SIEMENS, FlowArea)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Antegrade Flow (SRT, R-42047)
	[TV] TR Pk Grad [RV} RVSP: TR Pk Grad	Peak Gradient (LN, 20247-3)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
X	[TV] TR Vmax [P] TR Vmax	Peak Velocity (LN, 11726-7)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[TV] TR VTI	Velocity Time Integral (LN, 20354-7)	Flow Direction: Regurgitant Flow (SRT, R-42E61)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
X	[TV] TV A Vmax [D] TV Flow: TV A Vmax	Tricuspid Valve A Wave Peak Velocity (LN, 18030-7)	
X	[TV] TV Accel Slope	Acceleration Slope (99SIEMENS, AccelSlope)	
X	[TV] TV Decel Slope	Deceleration Slope (LN, 20216-8)	
	[TV] TV DT [D] TV Flow: TV DT	Deceleration Time (LN, 20217-6)	
X	[TV] TV E Vmax [D] TV Flow: TV E Vmax	Tricuspid Valve E Wave Peak Velocity (LN, 18031-5)	
X	[TV] TV Mean Grad	Mean Gradient (LN, 20256-4)	
	[TV] TV P1/2 Time	Pressure Half-Time (LN, 20280-4)	
	[TV] TV Pk Grad	Peak Gradient (LN, 20247-3)	
	[TV] TV SV	Stroke Volume (SRT, F-32120)	
	[TV] TV Vmax [P] TV Vmax	Peak Velocity (LN, 11726-7)	
	[TV] TV Vmean	Mean Velocity (LN, 20352-1)	
	[TV] TV VTI	Velocity Time Integral (LN, 20354-7)	
	[TV] TV VTI, Annulus	Velocity Time Integral (LN, 20354-7)	Finding Site: Tricuspid Annulus (SRT, T-35111)
X	[TV] TV VTI, Tips [D] TV Flow: TV VTI, Tips	Velocity Time Integral (LN, 20354-7)	Finding Site: Leaflet Tips (99SIEMENS, Leaflet Tips)
Measurements of Image Mode Doppler Color Flow (SRT, R-409E2)			
	[P] TR Aliasing Velocity	Alias Velocity (99SIEMENS, AliasVelocity)	Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] TR PISA Radius	Flow Radius (99SIEMENS, FlowRadius)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216) Flow Direction: Regurgitant Flow (SRT, R-42E61)
	[P] TV Aliasing Velocity	Alias Velocity (99SIEMENS, AliasVelocity)	Flow Direction: Antegrade Flow (SRT, R-42047)
	[P] TV Funnel Angle	Funnel Angle (99SIEMENS, FunnelAngle)	
	[P] TV PISA Radius	Flow Radius (99SIEMENS, FlowRadius)	Measurement Method: Proximal Isovelocity Surface Area (DCM, 125216)
Measurements of Image Mode: Doppler Pulsed (SRT, R-409E4)			
	[RV] RV Free Wall: A' [D] PW DTI, RV Free Wall: A'	TV Free Wall Aa (99SIEMENS, TVaPrime)	
	[RV] RV Free Wall: S' [D] PW DTI, RV Free Wall: S'	TV Free Wall Sa (99SIEMENS, TVsPrime)	
Measurements of Image Mode: M mode (SRT, G-0394)			
	[M] TV D-E Excursion	D to E point excursion (99SIEMENS, DEExcursion)	
	[M] TV EF Slope	E to F point slope (99SIEMENS, EFSlope)	

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[M] TAPSE	Tricuspid annular plane systolic excursion (99SIEMENS, TAPSE)	
	[M] TV DE Slope	D to E point slope (99SIEMENS, DESlope)	

7.1.10 Aorta

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Aorta		Container: Findings (DCM, 121070)	Finding Site: Aorta (SRT, T-42000)
Measurements of Image Mode: 2D mode (SRT, G-03A2)			
	[Ao] Aorta: Ao Abdominal Diam	Diameter (SRT, M-02550)	Finding Site: Abdominal Aorta (SRT, T-42500)
	[Ao] Aorta: Ao Ann Diam, d, PLAX	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Aortic Valve Ring (SRT, T-35410) Cardiac Cycle Point: Diastole (SRT, F-32010) Image View: Parasternal long axis (SRT, G-0396)
	[Ao] Aorta: Ao Ann Diam, s, PLAX	Cardiovascular Orifice Diameter (SRT, G-038F)	Finding Site: Aortic Valve Ring (SRT, T-35410) Cardiac Cycle Point: Systole (SRT, F-32020) Image View: Parasternal long axis (SRT, G-0396)
X	[Ao] Aorta: Ao Arch Diam	Aortic Arch Diameter (LN, 18011-7)	
X	[Ao] Aorta: Ao Arch Distal Diam	Aortic Arch Diameter (LN, 18011-7)	Topographical Modifier: Distal (SRT, G-A119)
	[Ao] Aorta: Ao Arch Trans Distal s	Diameter (SRT, M-02550)	Finding Site: Transverse Aortic Arch (SRT, T-42304) Topographical Modifier: Distal (SRT, G-A119) Cardiac Cycle Point: Systole (SRT, F-32020)
	[Ao] Aorta: Ao Arch Trans Prox s	Diameter (SRT, M-02550)	Finding Site: Transverse Aortic Arch (SRT, T-42304) Topographical Modifier: Proximal (SRT, G-A118) Cardiac Cycle Point: Systole (SRT, F-32020)
	[Ao] Aorta: Ao Asc Diam d	Ascending Aortic Diameter (LN, 18012-5)	Cardiac Cycle Point: Diastole (SRT, F-32010)
	[Ao] Aorta: Ao Asc Diam s	Ascending Aortic Diameter (LN, 18012-5)	Cardiac Cycle Point: Systole (SRT, F-32020)
X	[Ao] Aorta: Ao Desc Diam	Descending Aortic Diameter (LN, 18013-3)	
	[Ao] Aorta: Ao Isthmus d	Aortic Isthmus Diameter (LN, 18014-1)	
	[Ao] Aorta: Ao Isthmus s	Aortic Isthmus Diameter (LN, 18014-1)	Cardiac Cycle Point: Systole (SRT, F-32020)
	[Ao] Aorta: Ao Root d	Aortic Root Diameter (LN, 18015-8)	Finding Site: Aortic Valve Ring (SRT, T-35410) Cardiac Cycle Point: Diastole (SRT, F-32010)
	[Ao] Aorta: Ao Root s	Aortic Root Diameter (LN, 18015-8)	Finding Site: Aortic Valve Ring (SRT, T-35410) Cardiac Cycle Point: Systole (SRT, F-32020)
	[Ao] Aorta: Ao Sinus d	Aortic Root Diameter (LN, 18015-8)	Finding Site: Sinuses of Valsalva (99SIEMENS, SinusesValsalva) Cardiac Cycle Point: Diastole (SRT, F-32010)
	[Ao] Aorta: Ao Sinus s	Aortic Root Diameter (LN, 18015-8)	Finding Site: Sinuses of Valsalva (99SIEMENS, SinusesValsalva) Cardiac Cycle Point: Systole (SRT, F-32020)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[Ao] Aorta: Ao ST jnct d	Aortic Root Diameter (LN, 18015-8)	Finding Site: Sinotubular Junction (99SIEMENS, StJunct) Cardiac Cycle Point: Diastole (SRT, F-32010)
	[Ao] Aorta: Ao ST jnct s	Aortic Root Diameter (LN, 18015-8)	Finding Site: Sinotubular Junction (99SIEMENS, StJunct) Cardiac Cycle Point: Systole (SRT, F-32020)
	[Ao] Aorta: Ao Thoracic Diam	Diameter (SRT, M-02550)	Finding Site: Thoracic aorta (SRT, T-42070)
X	[Ao] Aorta: Coarct Diam	Diameter (SRT, M-02550)	Finding Site: Thoracic Aortic Coarctation (SRT, D4-32030)
Measurements are associated with CW and PW Doppler, so the image mode is not specified.			
X	[Ao] Aorta: Ao Asc Mean Grad	Mean Gradient (LN, 20256-4)	Finding Site: Ascending aorta (SRT, T-42100)
	[Ao] Aorta: Ao Asc Pk Grad	Peak Gradient (LN, 20247-3)	Finding Site: Ascending aorta (SRT, T-42100)
	[Ao] Aorta: Ao Asc Vmax	Peak Velocity (LN, 11726-7)	Finding Site: Ascending aorta (SRT, T-42100)
X	[Ao] Aorta: Ao Desc Mean Grad	Mean Gradient (LN, 20256-4)	Finding Site: Descending aorta (SRT, T-42400)
	[Ao] Aorta: Ao Desc Pk Grad	Peak Gradient (LN, 20247-3)	Finding Site: Descending aorta (SRT, T-42400)
	[Ao] Aorta: Ao Desc Vmax	Peak Velocity (LN, 11726-7)	Finding Site: Descending aorta (SRT, T-42400)
Measurements of Image Mode: M mode (SRT, G-0394)			
	[M] Ao Diam d	Aortic Root Diameter (LN, 18015-8)	Cardiac Cycle Point: Diastole (SRT, F-32010)
	[M] Ao Diam s	Aortic Root Diameter (LN, 18015-8)	Cardiac Cycle Point: Systole (SRT, F-32020)

7.1.11 Pulmonary Artery

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Pulmonary Artery		Container: Findings (DCM, 121070)	Finding Site: Pulmonary Artery (SRT, T-44000)
Measurements of Image Mode: 2D mode (SRT, G-03A2)			
	[A] Pulmonary Arteries: LPA Diam d	Left Pulmonary Artery Diameter (LN, 18019-0)	Cardiac Cycle Point: Diastole (SRT, F-32010)
	[A] Pulmonary Arteries: LPA Diam s	Left Pulmonary Artery Diameter (LN, 18019-0)	Cardiac Cycle Point: Systole (SRT, F-32020)
	[A] Pulmonary Arteries: MPA Diam d	Main Pulmonary Artery Diameter (LN, 18020-8)	Cardiac Cycle Point: Diastole (SRT, F-32010)
	[A] Pulmonary Arteries: MPA Diam s	Main Pulmonary Artery Diameter (LN, 18020-8)	Cardiac Cycle Point: Systole (SRT, F-32020)
	[A] Pulmonary Arteries: RPA Diam d	Right Pulmonary Artery Diameter (LN, 18021-6)	Cardiac Cycle Point: Diastole (SRT, F-32010)
	[A] Pulmonary Arteries: RPA Diam s	Right Pulmonary Artery Diameter (LN, 18021-6)	Cardiac Cycle Point: Systole (SRT, F-32020)
Measurements are associated with CW and PW Doppler, so the image mode is not specified.			
	[A] Pulmonary Arteries: LPA Pk Grad	Peak Gradient (LN, 20247-3)	Finding Site: Left pulmonary artery (SRT, T-44400)
	[A] Pulmonary Arteries: LPA Vmax	Peak Velocity (LN, 11726-7)	Finding Site: Left pulmonary artery (SRT, T-44400)
	[A] Pulmonary Arteries: MPA Pk Grad	Peak Gradient (LN, 20247-3)	

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[A] Pulmonary Arteries: MPA Vmax	Main Pulmonary Artery Peak Velocity (SRT, G-038A)	
	[A] Pulmonary Arteries: RPA Pk Grad	Peak Gradient (LN, 20247-3)	Finding Site: Right pulmonary artery (SRT, T-44200)
	[A] Pulmonary Arteries: RPA Vmax	Peak Velocity (LN, 11726-7)	Finding Site: Right pulmonary artery (SRT, T-44200)

7.1.12 Vena Cava

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Vena Cava		Container: Findings (DCM, 121070)	Finding Site: Vena Cava (SRT, T-48600)
Measurements of Image Mode: 2D mode (SRT, G-03A2)			
X	[RA] IVC Diam	Inferior Vena Cava Diameter (LN, 18006-7)	
X	[RA] SVC Diam	Diameter (SRT, M-02550)	Finding Site: Superior vena cava (SRT, T-48610)

7.1.13 Pulmonary Venous Structure

PVF is the Pulmonary Venous Flow table on the Diastology worksheet.

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Pulmonary Venous Structure		Container: Findings (DCM, 121070)	Finding Site: Pulmonary Venous Structure (SRT, T-48581)
Measurements of Image Mode: 2D mode (SRT, G-03A2)			
X	[PVn] LLPV: Diam [D] PVF, LLPV: Diam	Diameter (SRT, M-02550)	Topographical Modifier: Left Lower Segment (SRT, R-4214B)
X	[PVn] LUPV: Diam [D] PVF, LUPV: Diam	Diameter (SRT, M-02550)	Topographical Modifier: Left Upper Segment (SRT, R-40491)
X	[PVn] RLPV: Diam [D] PVF, RLPV: Diam	Diameter (SRT, M-02550)	Topographical Modifier: Right Lower Segment (SRT, R-4049E)
X	[PVn] RUPV: Diam [D] PVF, RUPV: Diam	Diameter (SRT, M-02550)	Topographical Modifier: Right Upper Segment (SRT, R-404A0)
Measurements are associated with CW and PW Doppler, so the image mode is not specified.			
	[PVn] LLPV: A dur [D] PVF, LLPV: A dur	Pulmonary Vein A-Wave Duration (SRT, G-038B)	Topographical Modifier: Left Lower Segment (SRT, R-4214B)
	[PVn] LLPV: A dur – MV A dur [D] PVF, LLPV: A dur – MV A dur	PV A dur - MV A dur (99SIEMENS, PVAminusMVA)	Topographical Modifier: Left Lower Segment (SRT, R-4214B)
	[PVn] LLPV: A Vmax [D] PVF, LLPV: A Vmax	Pulmonary Vein A-Wave Peak Velocity (99SIEMENS, VmaxPveinA)	Topographical Modifier: Left Lower Segment (SRT, R-4214B)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[PVn] LLPV: D Vmax [D] PVF, LLPV: D Vmax	Pulmonary Vein D-Wave Peak Velocity (99SIEMENS, VmaxPveinD)	Topographical Modifier: Left Lower Segment (SRT, R-4214B)
	[PVn] LLPV: D VTI [D] PVF, LLPV: D VTI	Pulmonary Vein D-Wave Velocity Time Integral (SRT, G-038D)	Topographical Modifier: Left Lower Segment (SRT, R-4214B)
	[PVn] LLPV: S Vmax [D] PVF, LLPV: S Vmax	Pulmonary Vein S-Wave Peak Velocity (99SIEMENS, VmaxPveinS)	Topographical Modifier: Left Lower Segment (SRT, R-4214B)
	[PVn] LLPV: S VTI [D] PVF, LLPV: S VTI	Pulmonary Vein S-Wave Velocity Time Integral (SRT, G-038C)	Topographical Modifier: Left Lower Segment (SRT, R-4214B)
	[PVn] LLPV: Systolic Filling Fraction [D] PVF, LLPV: Systolic Filling Fraction	Pulmonary Vein Systolic Filling Fraction (99SIEMENS, PVeinSysFillFrac)	Topographical Modifier: Left Lower Segment (SRT, R-4214B)
	[PVn] LLPV: S/D [D] PVF, LLPV: S/D	Pulmonary Vein Systolic to Diastolic Ratio (LN, 29452-0)	Topographical Modifier: Left Lower Segment (SRT, R-4214B)
	[PVn] LUPV: A dur [D] PVF, LUPV: A dur	Pulmonary Vein A-Wave Duration (SRT, G-038B)	Topographical Modifier: Left Upper Segment (SRT, R-40491)
	[PVn] LUPV: A dur – MV A dur [D] PVF, LUPV: A dur – MV A dur	PV A dur - MV A dur (99SIEMENS, PVAminusMVA)	Topographical Modifier: Left Upper Segment (SRT, R-40491)
	[PVn] LUPV: A Vmax [D] PVF, LUPV: A Vmax	Pulmonary Vein A-Wave Peak Velocity (99SIEMENS, VmaxPveinA)	Topographical Modifier: Left Upper Segment (SRT, R-40491)
	[PVn] LUPV: D Vmax [D] PVF, LUPV: D Vmax	Pulmonary Vein D-Wave Peak Velocity (99SIEMENS, VmaxPveinD)	Topographical Modifier: Left Upper Segment (SRT, R-40491)
	[PVn] LUPV: D VTI [D] PVF, LUPV: D VTI	Pulmonary Vein D-Wave Velocity Time Integral (SRT, G-038D)	Topographical Modifier: Left Upper Segment (SRT, R-40491)
	[PVn] LUPV: S Vmax [D] PVF, LUPV: S Vmax	Pulmonary Vein S-Wave Peak Velocity (99SIEMENS, VmaxPveinS)	Topographical Modifier: Left Upper Segment (SRT, R-40491)
	[PVn] LUPV: S VTI [D] PVF, LUPV: S VTI	Pulmonary Vein S-Wave Velocity Time Integral (SRT, G-038C)	Topographical Modifier: Left Upper Segment (SRT, R-40491)
	[PVn] LUPV: Systolic Filling Fraction [D] PVF, LUPV: Systolic Filling Fraction	Pulmonary Vein Systolic Filling Fraction (99SIEMENS, PVeinSysFillFrac)	Topographical Modifier: Left Upper Segment (SRT, R-40491)
	[PVn] LUPV: S/D [D] PVF, LUPV: S/D	Pulmonary Vein Systolic to Diastolic Ratio (LN, 29452-0)	Topographical Modifier: Left Upper Segment (SRT, R-40491)
	[PVn] RLPV: A dur [D] PVF, RLPV: A dur	Pulmonary Vein A-Wave Duration (SRT, G-038B)	Topographical Modifier: Right Lower Segment (SRT, R-4049E)
	[PVn] RLPV: A dur – MV A dur [D] PVF, RLPV: A dur – MV A dur	PV A dur - MV A dur (99SIEMENS, PVAminusMVA)	Topographical Modifier: Right Lower Segment (SRT, R-4049E)
	[PVn] RLPV: A Vmax [D] PVF, RLPV: A Vmax	Pulmonary Vein A-Wave Peak Velocity (99SIEMENS, VmaxPveinA)	Topographical Modifier: Right Lower Segment (SRT, R-4049E)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[PVn] RLPV: D Vmax [D] PVF, RLPV: D Vmax	Pulmonary Vein D-Wave Peak Velocity (99SIEMENS, VmaxPveinD)	Topographical Modifier: Right Lower Segment (SRT, R-4049E)
	[PVn] RLPV: D VTI [D] PVF, RLPV: D VTI	Pulmonary Vein D-Wave Velocity Time Integral (SRT, G-038D)	Topographical Modifier: Right Lower Segment (SRT, R-4049E)
	[PVn] RLPV: S Vmax [D] PVF, RLPV: S Vmax	Pulmonary Vein S-Wave Peak Velocity (99SIEMENS, VmaxPveinS)	Topographical Modifier: Right Lower Segment (SRT, R-4049E)
	[PVn] RLPV: S VTI [D] PVF, RLPV: S VTI	Pulmonary Vein S-Wave Velocity Time Integral (SRT, G-038C)	Topographical Modifier: Right Lower Segment (SRT, R-4049E)
	[PVn] RLPV: Systolic Filling Fraction [D] PVF, RLPV: Systolic Filling Fraction	Pulmonary Vein Systolic Filling Fraction (99SIEMENS, PVeinSysFillFrac)	Topographical Modifier: Right Lower Segment (SRT, R-4049E)
	[PVn] RLPV: S/D [D] PVF, RLPV: S/D	Pulmonary Vein Systolic to Diastolic Ratio (LN, 29452-0)	Topographical Modifier: Right Lower Segment (SRT, R-4049E)
	[PVn] RUPV: A dur [D] PVF, RUPV: A dur	Pulmonary Vein A-Wave Duration (SRT, G-038B)	Topographical Modifier: Right Upper Segment (SRT, R-404A0)
	[PVn] RUPV: A dur – MV A dur [D] PVF, RUPV: A dur – MV A dur	PV A dur - MV A dur (99SIEMENS, PVAminusMVA)	Topographical Modifier: Right Upper Segment (SRT, R-404A0)
	[PVn] RUPV: A Vmax [D] PVF, RUPV: A Vmax	Pulmonary Vein A-Wave Peak Velocity (99SIEMENS, VmaxPveinA)	Topographical Modifier: Right Upper Segment (SRT, R-404A0)
	[PVn] RUPV: D Vmax [D] PVF, RUPV: D Vmax	Pulmonary Vein D-Wave Peak Velocity (99SIEMENS, VmaxPveinD)	Topographical Modifier: Right Upper Segment (SRT, R-404A0)
	[PVn] RUPV: D VTI [D] PVF, RUPV: D VTI	Pulmonary Vein D-Wave Velocity Time Integral (SRT, G-038D)	Topographical Modifier: Right Upper Segment (SRT, R-404A0)
	[PVn] RUPV: S Vmax [D] PVF, RUPV: S Vmax	Pulmonary Vein S-Wave Peak Velocity (99SIEMENS, VmaxPveinS)	Topographical Modifier: Right Upper Segment (SRT, R-404A0)
	[PVn] RUPV: S VTI [D] PVF, RUPV: S VTI	Pulmonary Vein S-Wave Velocity Time Integral (SRT, G-038C)	Topographical Modifier: Right Upper Segment (SRT, R-404A0)
	[PVn] RUPV: Systolic Filling Fraction [D] PVF, RUPV: Systolic Filling Fraction	Pulmonary Vein Systolic Filling Fraction (99SIEMENS, PVeinSysFillFrac)	Topographical Modifier: Right Upper Segment (SRT, R-404A0)
	[PVn] RUPV: S/D [D] PVF, RUPV: S/D	Pulmonary Vein Systolic to Diastolic Ratio (LN, 29452-0)	Topographical Modifier: Right Upper Segment (SRT, R-404A0)

7.1.14 Cardiac Shunt Study

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Cardiac Shunt Study		Container: Findings (DCM, 121070)	Finding Site: Cardiac Shunt Study (SRT, P3-30031)
Measurements of Image Mode: 2D mode (SRT, G-03A2)			
X	[Sh] ASD Ant-Post Diam	Anterior-Posterior Diameter (99SIEMENS, AntPostDiam)	Finding Site: Atrial Septal Defect (SRT, D4-31220)
X	[Sh] ASD Major Diam	Major Axis (SRT, G-A193)	Finding Site: Atrial Septal Defect (SRT, D4-31220)
X	[Sh] ASD Minor Diam	Minor Diameter (99SIEMENS, MinorDiam)	Finding Site: Atrial Septal Defect (SRT, D4-31220)
X	[Sh] ASD Sup-Inf Diam	Superior-Inferior Diameter (99SIEMENS, SupInfDiam)	Finding Site: Atrial Septal Defect (SRT, D4-31220)
X	[Sh] PDA Diam	Diameter (SRT, M-02550)	Finding Site: Patent ductus arteriosus (SRT, D4-32012)
	[Sh] Pulm Side Area	Area (SRT, G-A166)	Finding Site: Pulmonary side (99SIEMENS, PulmonarySide)
X	[Sh] Pulm Side Diam	Diameter (SRT, M-02550)	Finding Site: Pulmonary side (99SIEMENS, PulmonarySide)
	[Sh] Sys Side Area	Area (SRT, G-A166)	Finding Site: Systemic side (99SIEMENS, SystemicSide)
X	[Sh] Sys Side Diam	Diameter (SRT, M-02550)	Finding Site: Systemic side (99SIEMENS, SystemicSide)
X	[Sh] VSD Diam	Diameter (SRT, M-02550)	Finding Site: Ventricular Septal Defect (SRT, D4-31150)
X	[Sh] VSD Major Diam	Major Axis (SRT, G-A193)	Finding Site: Ventricular Septal Defect (SRT, D4-31150)
X	[Sh] VSD Minor Diam	Minor Diameter (99SIEMENS, MinorDiam)	Finding Site: Ventricular Septal Defect (SRT, D4-31150)
Measurements are associated with CW and PW Doppler, so the image mode is not specified.			
	[Sh] ASD Pk Grad	Peak Gradient (LN, 20247-3)	Finding Site: Atrial Septal Defect (SRT, D4-31220)
	[Sh] ASD Vmax	Peak Velocity (LN, 11726-7)	Finding Site: Atrial Septal Defect (SRT, D4-31220)
	[Sh] Pulm Side CI	Cardiac Index (SRT, F-32110)	Finding Site: Pulmonary side (99SIEMENS, PulmonarySide) Index: Body Surface Area (LN, 8277-6)
	[Sh] Pulm Side CO	Cardiac Output (SRT, F-32100)	Finding Site: Pulmonary side (99SIEMENS, PulmonarySide)
	[Sh] Pulm Side HR	Composite heart rate (99SIEMENS, CompositeHR)	Finding Site: Pulmonary side (99SIEMENS, PulmonarySide)
	[Sh] Pulm Side SI	Stroke Index (SRT, F-00078)	Finding Site: Pulmonary side (99SIEMENS, PulmonarySide) Index: Body Surface Area (LN, 8277-6)
	[Sh] Pulm Side SV	Stroke Volume (SRT, F-32120)	Finding Site: Pulmonary side (99SIEMENS, PulmonarySide)
X	[Sh] Pulm Side VTI	Velocity Time Integral (LN, 20354-7)	Finding Site: Pulmonary side (99SIEMENS, PulmonarySide)
	[Sh] Qp/Qs	Pulmonary-to-Systemic Shunt Flow Ratio (LN, 29462-9)	
	[Sh] Qp-Qs	Difference between Pulmonary Valve CO and Aortic Valve CO (99SIEMENS, QpMinusQs)	
	[Sh] Sys Side CI	Cardiac Index (SRT, F-32110)	Finding Site: Systemic side (99SIEMENS, SystemicSide) Index: Body Surface Area (LN, 8277-6)
	[Sh] Sys Side CO	Cardiac Output (SRT, F-32100)	Finding Site: Systemic side (99SIEMENS, SystemicSide)
	[Sh] Sys Side HR	Composite heart rate (99SIEMENS, CompositeHR)	Finding Site: Systemic side (99SIEMENS, SystemicSide)

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	[Sh] Sys Side SI	Stroke Index (SRT, F-00078)	Finding Site: Systemic side (99SIEMENS, SystemicSide) Index: Body Surface Area (LN, 8277-6)
	[Sh] Sys Side SV	Stroke Volume (SRT, F-32120)	Finding Site: Systemic side (99SIEMENS, SystemicSide)
X	[Sh] Sys Side VTI	Velocity Time Integral (LN, 20354-7)	Finding Site: Systemic side (99SIEMENS, SystemicSide)
	[Sh] VSD Pk Grad [RV] RVSP: VSD Pk Grad	Peak Gradient (LN, 20247-3)	Finding Site: Ventricular Septal Defect (SRT, D4-31150)
	[Sh] VSD Vmax	Peak Velocity (LN, 11726-7)	Finding Site: Ventricular Septal Defect (SRT, D4-31150)

7.1.15 Private Section: Coronary Artery

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Coronary Artery		Container: Findings (DCM, 121070)	Finding Site: Coronary Artery (SRT, T-43000)
Measurements of Image Mode: 2D mode (SRT, G-03A2)			
X	[A] Coronary Arteries: Circumflex Diam	Diameter (SRT, M-02550)	Finding Site: Circumflex Coronary Artery (SRT, T-43120)
X	[A] Coronary Arteries: Circumflex Diam, Prox	Diameter (SRT, M-02550)	Finding Site: Circumflex Coronary Artery (SRT, T-43120) Topographical Modifier: Proximal (SRT, G-A118)
X	[A] Coronary Arteries: LAD Diam	Diameter (SRT, M-02550)	Finding Site: Left Anterior Descending Coronary Artery (SRT, T-4311A)
X	[A] Coronary Arteries: Left Main Diam	Diameter (SRT, M-02550)	Finding Site: Left Main Coronary Artery (SRT, T-43107)
X	[A] Coronary Arteries: RCA Diam	Diameter (SRT, M-02550)	Finding Site: Right Coronary Artery (SRT, T-43203)

7.1.16 Private Section: Left Ventricular Analysis

These measurements appear on the LVA/RVA worksheet in the LVA table.

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Left Ventricular Analysis		Container: Findings (DCM, 121070)	Finding Site: Left Ventricular Analysis (99SIEMENS, LVAnalysis)
	EDSI	End Diastolic Sphericity Index (99SIEMENS, EDSI)	
	EDV	Left Ventricular End Diastolic Volume (LN, 18026-5)	
	EF	Left Ventricular Ejection Fraction (LN, 18043-0)	
	ESSI	End Systolic Sphericity Index (99SIEMENS, ESSI)	

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	ESV	Left Ventricular End Systolic Volume (LN, 18148-7)	
	SV	Stroke Volume (SRT, F-32120)	
	DDI16	Diastolic Dyssynchrony Index (16 segment ASE model) (99SIEMENS, DDI16)	
	DISPED16	Dispersion End Diastole (16 segment ASE model) (99SIEMENS, DISPED16)	
	DISPES16	Dispersion End Systole (16 segment ASE model) (99SIEMENS, DISPES16)	
	MED16	Mean ED time (16 segment ASE model) (99SIEMENS, MED16)	
	MES16	Mean ES time (16 segment ASE model) (99SIEMENS, MES16)	
	PostContr16	Post-contraction Time Volume (16 segment ASE model) (99SIEMENS, PostContr16)	
	PreContr16	Pre-contraction Time Volume (16 segment ASE model) (99SIEMENS, PreContr16)	
	PostRelax16	Post-relaxation Time Volume (16 segment ASE model) (99SIEMENS, PostRelax16)	
	PreRelax16	Pre-relaxation Time Volume (16 segment ASE model) (99SIEMENS, PreRelax16)	
	SDI16	Systolic Dyssynchrony Index (16 segment ASE model) (99SIEMENS, SDI16)	
	DDI17	Diastolic Dyssynchrony Index (17 segment ASE model) (99SIEMENS, DDI17)	
	DISPED17	Dispersion End Diastole (17 segment ASE model) (99SIEMENS, DISPED17)	
	DISPES17	Dispersion End Systole (17 segment ASE model) (99SIEMENS, DISPES17)	
	MED17	Mean ED time (17 segment ASE model) (99SIEMENS, MED17)	
	MES17	Mean ES time (17 segment ASE model) (99SIEMENS, MES17)	
	PostContr17	Post-contraction Time Volume (17 segment ASE model) (99SIEMENS, PostContr17)	
	PreContr17	Pre-contraction Time Volume (17 segment ASE model) (99SIEMENS, PreContr17)	
	PostRelax17	Post-relaxation Time Volume (17 segment ASE model) (99SIEMENS, PostRelax17)	

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	PreRelax17	Pre-relaxation Time Volume (17 segment ASE model) (99SIEMENS, PreRelax17)	
	SDI17	Systolic Dyssynchrony Index (17 segment ASE model) (99SIEMENS, SDI17)	

7.1.17 Private Section: Right Ventricular Analysis

These measurements appear on the LVA/RVA worksheet in the RVA table.

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Right Ventricular Analysis		Container: Findings (DCM, 121070)	Finding Site: Right Ventricular Analysis (99SIEMENS, RVAnalysis)
	EDV	Right Ventricular End Diastolic Volume (99SIEMENS, RVEDV)	
	EF	Right Ventricular Ejection Fraction (99SIEMENS, RVEF)	
	ESV	Right Ventricular End Systolic Volume (99SIEMENS, RVESV)	
	SV	Stroke Volume (SRT, F-32120)	

7.1.18 Private Section: Stress Echo

Beginning with the VA12A release, Left Ventricular Analysis can be performed on images acquired during a Stress Echo stage. The Stress Echo LVA results for a single stage are contained within a Private Stress Echo SR section as described below.

TID 5200 Extension

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
22	>	CONTAINS	INCLUDE	Private TID: Stress Echo	1-n	U		

Private TID: Stress Echo

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (121070, DCM, “Findings”)	1	M		
2	>	HAS CONCEPT MOD	CODE	EV (121058, DCM, “Procedure reported”)	1	M		DT (StressEcho, 99SIEMENS, “Stress Echo”)

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
3	>	HAS ACQ CONTEXT	NUM	(StageNumber,99SIEMENS, ”Stage Number”)	1	M		UNITS = EV (1, UCUM, ”no units”)
4	>	HAS ACQ CONTEXT	CODE	EV (LN, 18139-6, “Stage”)	1	M		BCID (12002) Ultrasound Protocol Stage Types
5	>	HAS ACQ CONTEXT	TEXT	EV (UserStageName, 99SIEMENS, “User-defined Stage Name”)	1	U		
6	>	CONTAINS	CONTAINER	DT (125007, DCM, “Measurement Group”)	1-n	M		
7	>>	HAS CONCEPT MOD	CODE	EV (G-C0E3, SRT, “Finding Site”)	1	M		Private CID: Stress Echo Finding Sites Only present for LV Analysis measurements
8	>>	CONTAINS	INCLUDE	DTID (5203) Echo Measurement	1-n	M		The Stress Echo LV Analysis measurements are listed in Section 7.1.18.1.

CID 12002 Ultrasound Protocol Stage Types (Only applicable values are listed)

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
Include CID 3207 Stress Test Procedure Phases		

CID 3207 Stress Test Procedure Phases (Only applicable values are listed)

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)	SC2000 Stage Name
SRT	F-01602	Baseline	Baseline
SRT	F-05028	Peak cardiac stress state	Peak Exercise or Peak
SRT	F-05018	Cardiac stress recovery state	Recovery
99SIEMENS	Rest	Rest	Rest
99SIEMENS	Post	Post	Post
99SIEMENS	PostExercise	Post Exercise	Post Exercise
99SIEMENS	Impost	Impost	Impost
99SIEMENS	LowExercise	Low Exercise	Low Exercise
99SIEMENS	LowDose	Low Dose	Low Dose
99SIEMENS	HighDose	High Dose	High Dose
99SIEMENS	5µg	5 µg/kg/min	5 µg/kg/min
99SIEMENS	10µg	10 µg/kg/min	10 µg/kg/min
99SIEMENS	20µg	20 µg/kg/min	20 µg/kg/min
99SIEMENS	30µg	30 µg/kg/min	30 µg/kg/min
99SIEMENS	40µg	40 µg/kg/min	40 µg/kg/min
99SIEMENS	50µg	50 µg/kg/min	50 µg/kg/min
99SIEMENS	Atropine	Atropine	Atropine
99SIEMENS	Adenosine	Adenosine	Adenosine

Private CID Stress Echo Stage Finding Sites

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
99SIEMENS	LVAnalysis	Left Ventricular Analysis

7.1.18.1 Stress Echo – LVA

These measurements appear on the Stress Echo-LVA worksheet.

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
Stress Echo		Container: Findings (DCM, 121070)	Procedure reported: Stress Echo (99SIEMENS, StressEcho) Stage Number (99SIEMENS, StageNumber) Stage (LN, 18139-6) User-defined Stage Name (99SIEMENS, UserStageName)
Measurements of Finding Site: Left Ventricular Analysis (99SIEMENS, LVAnalysis)			
	EDV	Left Ventricular End Diastolic Volume (LN, 18026-5)	
	EDSI	End Diastolic Sphericity Index (99SIEMENS, EDSI)	
	EF	Left Ventricular Ejection Fraction (LN, 18043-0)	
	ESSI	End Systolic Sphericity Index (99SIEMENS, ESSI)	
	ESV	Left Ventricular End Systolic Volume (LN, 18148-7)	
	SV	Stroke Volume (SRT, F-32120)	
	DDI16	Diastolic Dyssynchrony Index (16 segment ASE model) (99SIEMENS, DDI16)	
	DISPED16	Dispersion End Diastole (16 segment ASE model) (99SIEMENS, DISPED16)	
	DISPES16	Dispersion End Systole (16 segment ASE model) (99SIEMENS, DISPES16)	
	MED16	Mean ED time (16 segment ASE model) (99SIEMENS, MED16)	
	MES16	Mean ES time (16 segment ASE model) (99SIEMENS, MES16)	
	PostContr16	Post-contraction Time Volume (16 segment ASE model) (99SIEMENS, PostContr16)	
	PreContr16	Pre-contraction Time Volume (16 segment ASE model) (99SIEMENS, PreContr16)	
	PostRelax16	Post-relaxation Time Volume (16 segment ASE model) (99SIEMENS, PostRelax16)	
	PreRelax16	Pre-relaxation Time Volume (16 segment ASE model) (99SIEMENS, PreRelax16)	
	SDI16	Systolic Dyssynchrony Index (16 segment ASE model) (99SIEMENS, SDI16)	
	DDI17	Diastolic Dyssynchrony Index (17 segment ASE model) (99SIEMENS, DDI17)	
	DISPED17	Dispersion End Diastole (17 segment ASE model) (99SIEMENS, DISPED17)	

HR	Label	Code Meaning (Coding Scheme Designator, Code Value)	Modifiers
	DISPES17	Dispersion End Systole (17 segment ASE model) (99SIEMENS, DISPES17)	
	MED17	Mean ED time (17 segment ASE model) (99SIEMENS, MED17)	
	MES17	Mean ES time (17 segment ASE model) (99SIEMENS, MES17)	
	PostContr17	Post-contraction Time Volume (17 segment ASE model) (99SIEMENS, PostContr17)	
	PreContr17	Pre-contraction Time Volume (17 segment ASE model) (99SIEMENS, PreContr17)	
	PostRelax17	Post-relaxation Time Volume (17 segment ASE model) (99SIEMENS, PostRelax17)	
	PreRelax17	Pre-relaxation Time Volume (17 segment ASE model) (99SIEMENS, PreRelax17)	
	SDI17	Systolic Dyssynchrony Index (17 segment ASE model) (99SIEMENS, SDI17)	

7.2 Appendix B: Supported Units in Structured Reports

The following UCUM units, Version 1.4, are used in the structured reports of the ACUSON SC2000 system.

Label	Code Value	Code Meaning
bpm	bpm	beats per minute
circs/s	circs/s	circles per second
cm	cm	centimeters
cm/s	cm/s	centimeters per second
cm^2	cm2	square centimeters
cm^2/m^2	cm2/m2	square centimeters per square meter
deg	deg	Degrees of angle
g	g	grams
g/cm	g/cm	grams per centimeter
g/cm^2	g/cm2	grams per square centimeter
g/m^2	g/m2	grams per square meter

Label	Code Value	Code Meaning
l/min	l/min	liters per minute
l/min/m^2	l/min/m2	liters per minute per square meter
m	m	meters
m/s	m/s	meters per second
m/s^2	m/s2	meters per square second
m^2	m2	square meters
ml	ml	milliliters
ml/m^2	ml/m2	milliliters per square meter
ml/s	ml/m2	milliliters per second
ml*%	ml*%	milliliters percent
mm	mm	millimeters
mm^2	mm	square millimeters
mmHg	mm[Hg]	millimeters of mercury column
mmHg/s	mm[Hg]/s	millimeters of mercury per second
msec	ms	milliseconds
[unitless]	1	no units
%	%	percent
years	a	years
days	d	days
weeks	wk	weeks
months	mo	months